

## IV. Design Program - Narratives

### 1000 Architectural and Interior Finishes

#### A. Site Context

The development of the 1063 Building is sited within the West Capitol Campus, bounded by Capitol Way S to the east, Columbia Ave SW to the west and 11<sup>th</sup> Ave SW to the south. Current structures on site include the 156-car GA Parking Garage constructed in 1958 for the State of Washington, and the two-story 1930's Capitol Park (1063) property was built by Dawley Construction and purchased by the state. Both buildings are planned for demolition in anticipation of the new office building.

Located at the northern edge of the campus, the site is in a prominent gateway position from Downtown Olympia and marks the northern edge of the Capitol's Greensward. The site has commanding views in all directions. The 2006 *Master Plan for the Capitol of the State of Washington* discusses the importance of the site on the Capitol Campus. It is a transition point between the more informal activities of downtown with its denser, urban character to the formal government functions of the Capitol Campus and its open campus character. The building relationships within the West Capitol Campus focus on the Legislative Building, the activity center of the group. Open spaces are scaled in a hierarchy and encourage pedestrian flow in and out of the buildings as well as around them.



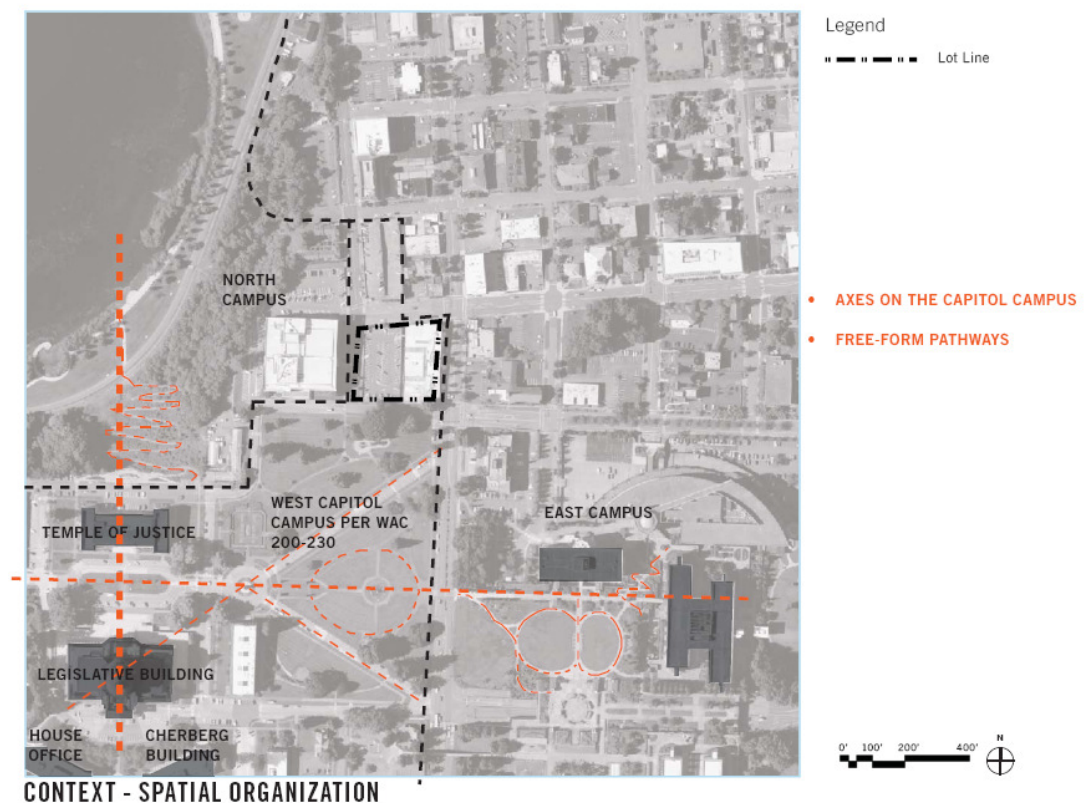
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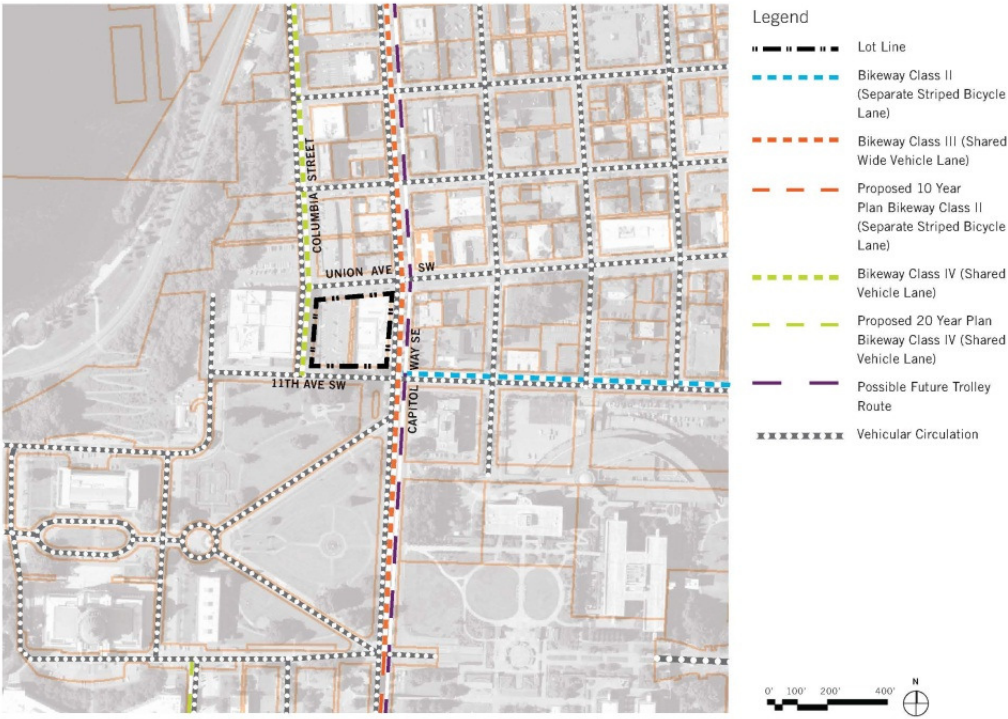
## B. Building Design

The design of the new office building shall follow the Capitol Campus design standards as outlined in the 2006 master plan and General Administration standards, while responding to the site's unique conditions and context. As a state government building, it should represent the ideals of the State of Washington.

### 1. Design Analysis

With the site's strong presence on the capitol green and prominent location, the design approach shall complement the historically significant Capitol Campus while at the same time express the site's role as a transition zone between the Capitol Campus and Olympia's commercial core and between West, North and East Campuses. The many elements that define the campus should be studied during the design process including view corridors, axes, edges, buffers, transitional zones and topography, pedestrian and vehicular circulation. The June 2006 Master Plan for the Capitol of the State of Washington should also be reviewed. The following diagrams illustrate some preliminary analysis:





CONTEXT - CIRCULATION



CONTEXT - LANDSCAPE



2. Design Approach

The following shall be considered in the development of concept and design work:

- a. Enhance the established hierarchy of campus space and function.
- b. Respect the architectural style, scale and spatial structure of the West Campus and capture its spirit.
- c. Develop a building which reflects its role within the context of the campus and in relationship to the Legislative Building as the primary campus "monument".
- d. The height of the proposed building above its grade as measured from its south elevation shall not exceed the 59 foot height above grade, of the main building mass of the Cherberg Building. Similarly, the height of the proposed building's penthouse shall not exceed the height of the Cherberg Building's modern mechanical penthouse.
- e. All concepts shall result in an appropriately scaled sequence of forms relating to existing campus open space and defining buildings.
- f. Evaluate the relationship of the project to adjoining campus spaces and buildings to develop massing and setbacks including potential future redevelopment of the GA Building site and intervening street right-of-way.
- g. Prepare concepts that develop sequenced exterior spaces, as much as possible, which support the larger campus but establish a hierarchy specific to this site.
- h. Concepts shall reflect a hierarchy of public/ceremonial to private office functions. This hierarchy shall be addressed in both exterior and interior spaces and shall be consistent with existing campus patterns.
- i. Create a hierarchy of "public face" or entry requirements for each major program component. Tenants within the building need to be identified by visitors via ground signage, lobby signage, etc., not broadcast on the exterior of the building.
- j. Develop a formal northern edge to the campus central space consistent with existing west campus structures.
- k. The south façade of the proposed building should reflect the character of the buildings bordering the central campus space.
- l. Consider the surrounding city streets for access and urban design continuity.
- m. Consider the various approach sequences to the project site and building from the campus and city for all modes.
- n. Provide transition in scale, massing, character and function to the city and surrounding community. Consider that all sides of the site are public and the site does not have a "back".
- o. Avoid the creation of a wall between the Capitol Campus and downtown Olympia and explore opportunities for pedestrian connections to and from the Campus and downtown.
- p. Establish public activity and create a façade at street level along Capitol Way that engages the street as much as possible, given the program parameters, and enhances the pedestrian activity along the sidewalk.

- q. Evaluate the opportunity for framing or establishing vistas, axis and views into, through and from the site.
- r. Design solutions should reflect the architectural thinking of our time and should not merely mimic existing campus historic styles.
- s. The 1063 building may act as a catalyst for new, contemporary development in this transition zone.
- t. Buildings which will be demolished as a result of the 1063 project have a place in the collective memory of the community. Consider ways to recycle or recall distinctive features of the old 1063 building and adjacent GA building. The 1063 building's deco detailing and the GA's signature lobby mural and great seal on the façade are some of the possible elements which might be literally or symbolically reused or recalled in the new building.

Detailed discussion on tenant needs, access, layout, organization and other functional issues is provided in Section V. Design Program – Space Program, Room Data Sheets, Drawings and Diagrams. Parking is described as an 'Add-Alternate'.

#### **C. Site Design**

The visual image conveyed by the building is defined by its architectural character as well as its site design. The site must include an entry plaza and human-scaled open space within the complex for tenants and the public to use as a place for passive recreation and to circulate through.

#### **D. Sustainability**

The project is expected to be a high performance building. Sustainable and efficient systems should provide all tenants with flexible and modernized office space and amenities. State-of-the-art strategies should include:

1. New standard for high performance State offices.
2. Earn LEED for New Construction & Major Renovations (LEED-NC) 2009 Gold Certification.
3. Highest performance achievable.
4. Future flexibility to support energy performance.
5. Highly collaborative design effort.

#### **E. Building Exterior / Interior Finishes, Materials and Furnishings**

Tenants seek a building that appears aesthetically pleasing, efficient and functional, and inspires confidence and trust.

Materials, finishes and furnishings should be of good quality, contributing to an overall appearance that is professional but not extravagant. The use of permanent, quality exterior finishes is preferred.

Throughout the facility, materials, finishes and furnishings should be attractive and non-polluting. Open offices areas will be furnished with both conventional office furniture and a component furniture system from Washington State Correctional Industries. Furnishings will be tenants' responsibility, but coordination with the overall building design is required.

Materials should be durable for high traffic areas and help reinforce each tenant's functions. The WSP's receptionist station controlling access to interior areas (beyond which visitors are escorted) should look welcoming but convey the message that visitors have limited access to the building. An additional display area for WSP should be conducive to the overall professional reputation of the agency.

Shared use spaces such as conference rooms and elevator lobbies that may be accessed most often by visitors should present a positive, welcoming image.

All materials, finishes and furnishings shall meet life-cycle cost analysis standards and established sustainability goals. Building life expectancy is a minimum of 50 years.

**F. General Code Requirements / Design Standards**

1. Design and construction shall adhere to the latest applicable codes, unless stated otherwise. Upon request by the Owner, the Design-Build team shall provide calculations supporting the design and the adherence to codes, regulations and requirements. Current Washington State code references include:
  - a. 2012 International Building Code (IBC) with Washington State Amendments.
  - b. 2012 International Energy Code (IEC) with Washington State Amendments.
  - c. 2012 Uniform Plumbing Code (UPC) with Washington State Amendments.
  - d. 2012 International Mechanical Code (IMC) with Washington State Amendments.
  - e. 2012 International Fire Code (IFC) with Washington State Amendments.
  - f. 2008 National Electric Code for Technical Electrical Requirements.
2. Additional standards include:
  - a. Real Estate State Facility Standards.
  - b. 2003 Accessible & Usable Buildings & Facilities (ICC/ANSI A117.1).
  - c. LEED-NC 2009 GOLD Certification.
  - d. Capitol Campus Master Plan.
  - e. General Administration Facilities Design Guidelines & Construction Standards.

**G. Public Art**

1. Public art should be provided as part of the open space design. The art shall be of the highest quality and reflect subjects of statewide significance, per the 2006 master plan guidelines.

**H. Special Considerations**

1. Subject to Owner review, three main tenant groups will occupy the building:
  - a. Washington State Patrol (*primary tenant*).
  - b. Office of Financial Management (OFM).
  - c. Legislative Agencies (LEAP, JTC, JLARC, WSIPP, and LSC).

These tenants have specified adjacency and privacy requirements, technical requirements, shared use space opportunities, and public accessibility requirements to consider as described in Section V. Design Program – Space Program, Room Data Sheets, Drawings and Diagrams.

2. The site is on campus and therefore governed by the Capitol Campus 2006 Master Plan.

## **1010 Landscape**

The landscape design includes the selection, placement, and maintenance of plant material on the site, the design of the irrigation system, and the selection and placement of site furniture. The visual image conveyed by the office building is not defined just by the architectural character and site organization, but also by an attractive, organized landscape design. The presence of plant material on the site greatly enhances the visual character, environmental quality of the building, the irrigation system provides water essential for plant material growth, and the site furniture supports the outdoor spaces for the users and visitors.

### **A. Landscape Objectives**

1. Support the goals and objectives as outlined in the 2009 Landscape Preservation Master Plan.
2. The overall purpose of plant materials on the site is to improve the physical and psychological well-being of the people who work or visit the building. This is achieved through the following objectives:
3. Improve the overall visual quality of the site by the use of native and indigenous plant material.
4. Provide scale and comfort to pedestrian environments.
5. Screen unsightly views.
6. Buffer incompatible uses.
7. Minimize maintenance by specifying native plant materials that require less maintenance to survive.
8. Simplicity – Landscape plans are to be broad and simple in form to limit excessive maintenance by grouping in beds with simple shapes that are easy to maintain. Avoid small lawn areas that are difficult to mow. Minimize the use of annual beds because of the high maintenance involved.
9. Security – Landscaping should be integrated with the security requirements. Low shrubs, groundcover, annual/perennial plants and canopy trees provide seasonal interest as well as maintain views required to ensure security measures. Avoid the use of large evergreen trees or other plant materials that permit concealment of criminals or obstruct the view of security personnel and CCTV, in accordance with accepted CPTED principles.

### **B. Sustainable Landscape Development**

1. The use of plant material on the site promotes the sustainability of the project.

### **C. Irrigation System Design**

1. The irrigation system shall promote sustainability which may include tie into the campus irrigation system or reclaim / gray water system.

## 1020 Operations, Maintenance, Energy Performance and LEED Program

### A. Narrative and Systems Overview

1. Building operations and maintenance of the environmental control systems shall be engineered and designed with long term operations efficiency and cost performance.
2. The environmental controls of the building shall consist of the mechanical, electrical, telecommunications, security, building controls and specialty systems.
3. Design the Building Envelope, Lighting, other end use systems, and HVAC to maximize Building Operations, Maintenance and Energy Performance.
4. At a minimum, the project should be designed to achieve a desired Energy Use Index (EUI) Goal of 25-40 kBtu/sf-yr, energy savings over Washington State Energy Codes in effect at the time of project permitting, and LEED for New Construction & Major Renovations (LEED-NC) 2009 Gold Certification.
5. The Building Performance Criteria will be established in accordance with LEED-NC 2009, EA, Credit 1, Optimize Energy Performance, Option 1, Whole Building Simulation.
6. Resultant savings shall be analyzed for proposed design as compared to ASHRAE standard 90.1-2007, which establishes minimum requirements for Energy Efficient Design of Buildings for LEED EA Credit 1.
7. **Proposer is encouraged to propose the greatest performance energy savings to achieve the Desired EUI Goal, so long as the Maximum GMP (defined elsewhere in the RFP) is not exceeded.**
8. If the Design-Build Contractor's base GMP does not include a design which achieves the Desired EUI Goal, then the Design-Build Contractor shall also provide a detailed additive "Guaranteed Alternate Price" proposal that shows how the Design-Build Contractor would ultimately achieve the Desired EUI Goal. Such a Guaranteed Alternate Price should assume that the Owner may later elect to increase the Maximum Allowable Proposer Budget by exercising this additive alternate. Such a Guaranteed Alternate Price proposal must include a detailed cost breakdown correlated to a detailed list of the additive features necessary to achieve the Desired EUI Goal.

### B. Utility and other Energy Efficiency Incentives

1. Design-Build Contractor shall research and identify available federal, state, and local utility incentive rebate opportunities suitable to the project and provide a cost-benefit analysis of such to the Owner for consideration, including, but not limited to:
  - a. Alternative energy measures such as LED lighting and heat recovery.
  - b. Alternative and renewable energy measures such as geothermal exchange, photovoltaic electrical systems.
  - c. Other available energy efficiency incentive rebate and tax programs.
2. For incentives selected by the Owner, the Design-Build Contractor shall make all required applications and complete all necessary documentation.

### C. Operations, Maintenance and Energy Performance Design Submittal Requirements

The Design-Build Contractor must provide the following documentation and calculations as part of the RFP response and submittal:



1. A narrative explanation of Design-Build Contractor's building environmental systems (i.e. lighting, envelope, HVAC, domestic hot water, electrical, telecommunications, special systems and others) that are proposed for achieving:
  - a. Operational and Maintenance efficiencies.
  - b. Design-Build Contractor's Energy Savings Commitment offer, which must meet or exceed the Owner's Desired EUI Goal (as listed above), and which will be provided at a cost included within the Design-Build Contractor's base GMP; and,
  - c. Design-Build Contractor's Alternative Energy Savings Commitment offer, which meets or exceeds the Owner's Desired EUI Goal, and which may be provided at a cost in addition to the Design-Build Contractor's base GMP, for an additional amount stipulated by the Design-Build Contractor's Additive Alternate Price proposal, for reaching or exceeding the Desired EUI Goal.
2. Description of calculation methods including modeling software, zoning, baseline assumptions, and proposed building assumptions used in preparing the analysis.
3. Submit a proposed ELCCA Work Plan adapted to Design-Build delivery and illustrating the ELCCA integration with the Design-Build process. For reference, review the Energy Life-cycle Cost Analysis Guidelines for Public Agencies in Washington State, November 2005, revised April 2013, Figure 2.1 and Chapter 4.
4. Submit building energy estimated results for both the baseline building and the proposed building design concept:
  - a. Annual energy usage breakdown by system category: HVAC, interior lighting, exterior lighting, plug and equipment loads, domestic hot water, miscellaneous.
  - b. Summary of annual natural gas (if applicable) and electrical energy usage and energy costs based on current utility rate schedules.
5. Submit the energy target statement of proposed building design concept using EPA's Target Finder for Architects and Engineers.

After contract award, the Design-Build Contractor must provide the following documentation and calculations as part of completing the final LEED submittal requirements and design phase services:

- a. During the design phases, a life cycle cost analysis worksheet must be prepared for the proposed HVAC system, and any proposed energy alternatives. Utilize the Washington State DES Energy Life Cycle Cost Spreadsheet and established escalation and discount rates. The spreadsheet determines the cumulative costs (30 year life cycle costs) of ownership. Provide a description of any assumptions used in preparing this analysis.
  - b. Prepare an ELCCA Report as outlined in Chapter 6 of the Energy Life-cycle Cost Analysis Guidelines for Public Agencies in Washington State, November 2005, revised April 2013 and adapted to this Design-Build delivery.
6. The Design-Builder must develop and submit to USGBC in accordance with LEED submittal documentation requirements for EA Credit 1, and ultimately attain Design-Build Contractor's proposed number of points for this credit. Additionally, for Energy Star compliance the Design-Builder must submit all documentation at design completion to EPA energystar.gov.

**D. Measurement and Verification of Building Energy Performance**

1. Develop and implement a Building Operations and Maintenance Plan and Building Energy Accountability Plan for the performance period. As part of this plan, the Measurement and Verification Plan (M&V) shall be prepared in accordance with LEED-NC 2009 EA Credit 5.
2. After contract award, Design-Build Contractor must develop M&V Plan in accordance with LEED submittal documentation requirements for this credit, EA Credit 5.
3. The M&V Plan must be consistent with standard EVO 1000-1.2007, IPMVP, Option D: Calibrated simulation to predict facility energy use: <http://www.evo-world.org>.
4. Calibration of the building energy model requires a minimum of 12 consecutive months of post commissioned and occupied operation with a minimum of 80% occupancy. The initial one year performance period shall be based on a 12 month average percentage of occupied rentable sf / total rentable square footage x 100. If the minimum average building occupancy rate is not achieved in the initial 12 months after project completion, the initial M&V performance verification and reporting will be extended until the minimum average occupancy rate is achieved.
5. Following calibration, the predicted energy savings shall be validated based on the energy calibrated model minus the actual period of energy used, plus or minus calibration error in the metered data.
6. The completed result of the M&V first year report shall be submitted to the Owner with the following written documentation:
  - a. Executive summary and overview.
  - b. Input and Output data files used for simulation.
  - c. Measured data used and meter accuracy.
  - d. Calibration report on adjustment made in energy model calibration and the accuracy in which simulations match actual energy metered data.
  - e. Findings and recommendations.
  - f. Ongoing M&V Procedures, reporting templates and annual reporting for remaining Performance Period.
  - g. Operation and maintenance issues and recommendations for resolution.
  - h. Update current energy use findings, strategies, issues and recommendations.
  - i. Additional energy efficiency improvement opportunities identified.
  - j. Predicted vs. actual energy use summary report by end use and total usage by energy source.

**The following are the Performance Articles inserted in the Design-Builder Contract.**

**3.13 Performance Guarantee.** Design-Builder shall provide Owner with a Performance Guarantee for the Project as set forth herein.

**3.13.1 Performance Validation.** Performance assurance (PA) and measurement and verification (M&V) shall be measured annually for five (5) years from the date of Substantial Completion.

**3.13.2 Scope.** Design-Builder's Performance Guarantee shall cover the operations, maintenance, and performance of all systems that are related to the environmental controls of the building. The building's environmental controls shall consist of the mechanical, electrical, telecommunications, security, building controls, and specialty systems.

**3.13.3 Energy and Sustainability Performance Requirement Measurements.** Design-Builder, in mutual agreement with Owner, shall devise a method of performance assurance and measurement & verification, which shall assure that the targeted building performance is achieved. The plan shall cover how the Performance Guarantee is administered, reviewed and measured during the Performance Guarantee Period. The plan also shall outline the overall compensation, review period payment releases, and non-performance compensation. The compensation held during the later years of the performance period will be higher creating a tiered release schedule as the building ages and operational requirements become more critical.

Performance validation shall be measured annually by evaluating whether the building meets the designated performance criteria developed by Design-Builder in consultation with Owner. Such measures, at a minimum, shall include:

- the M&V Plan results and annual reports over the stipulated performance period;
- the building energy use performance target as compared to actual metered utility usage at or near the end of the one-year period;
- operational and maintenance costs at or near the end of the one-year period.

**3.13.4 Financial Guarantee.** Owner shall withhold a pre-determined amount from the Contract Sum, during the Performance Guarantee Period. Release of payment for this withheld amount shall be contingent upon the final confirmation that the operations, maintenance and energy use index (EUI) performance standards for the facility (i.e. actual EUI = BTU/GSF-Year) have been achieved as verified by the M&V conducted over the 5 year (1,825 days) period. The start date of the Performance Guarantee Period is the date, post-Substantial Completion, when the building is at a minimum of 80% occupancy. The withheld amount shall be \$420,000 which is equivalent to the approximate value of the estimated operations, maintenance and energy operating costs for the first year. Design-Builder may propose a performance bond in lieu of the withheld amount as mutually approved with Owner.

If the actual operations, maintenance, and EUI as presented in the M&V findings and recommendations is equal to or better than the guaranteed performance requirements, a percentage of withheld amount will be released annually as noted in the approved plan indicated above.

If the actual operations, maintenance, and EUI as presented in the M&V findings and recommendations fails to meet the guaranteed performance requirements, the Design-Builder shall make a proportionate performance compensation payment to the Owner at the end of the performance period to account for the performance differences from the approved plan.

## 1030 Site/Civil Design

The replacement of the 1063 Block buildings will include demolition of the existing buildings, construction of new utility systems, pavement, sidewalks and landscaping. The Design-Builder will be responsible for all design, permitting, construction and materials testing for the civil infrastructure for the building replacement project.

### A. Codes & Standards

The following codes/guidelines must be adhered to:

1. 2008 General Administration Facilities Design Guidelines and Construction Standards.
2. 2009 Drainage Design and Erosion Control Manual for Olympia.
3. 2012 City of Olympia Engineering Design and Development Standards (EDDS).

### B. Narrative and Systems Overview

1. Existing Site Conditions  
The site is located on the Washington State Capitol Campus. The site is bound on all four sides by asphalt roads with curb, gutter, sidewalk and street trees. A two story building and a parking garage currently occupy the site.
2. Topographic Survey  
A Capitol Campus Survey Control map and a topographic survey have been completed by Parametrix. Layout of proposed improvements and survey control shall be per 01 71 23 of 2008 GA Guidelines and Standards.
3. Geotechnical Report Findings  
A geotechnical report has been completed by Golder Associates. See Appendix, Section I, c. Geotechnical Report.
4. Demolition  
Demolish existing 1063 Block buildings. Demolition shall include slab and foundation removal. The Design-Builder has the option to salvage building materials for cost savings or LEED points.
  - a. It is a goal to protect the existing trees to remain (per 2008 GA Guidelines & Standards). If trees cannot be preserved the Design-Builder shall provide an alternative to replace the trees.
  - b. Cap / abandon, remove and terminate appropriately existing utility connections per City of Olympia standards.
  - c. Existing traffic signal equipment, power poles and street light poles shall be protected during demolition. The existing power pole on the south side of Union near the middle of the block shall be removed once the existing electrical service is removed from the pole (see Article 1070).
  - d. Coordinate salvage of existing parking meters with the City of Olympia Parking Enforcement. The City will remove the parking meters, and require two days' notice prior to removal. Once the parking stalls are no longer available to the public the project will be required to pay \$10,00 day per stall. This cost will be covered by the Design-Builder.
5. Earthwork  
Any voids left by foundation removal shall be filled with structural fill and compacted to 95%.

6. Water Supply System

A new water system shall be provided and connected to the City of Olympia water system. Booster pumps may be required to meet water requirements for the building (see Article 1066).

The fire department connection and need for a separate fire line shall be coordinated with the City of Olympia Fire Marshall (see Article 1060, 1062, 1066).

The Design-Builder shall provide for a future connection stub to the City of Olympia reclaimed water system which can be used for toilet flushing, irrigation, and fountain/pond features.

7. Sanitary Sewer Systems

A new sanitary sewer system shall be provided that connects the building waste plumbing to the City of Olympia sanitary sewer system. The Design-Builder shall design the side sewer connections from the building to the existing sanitary sewer mains in the adjacent streets. The side sewer connections and any required sanitary sewer mains shall be designed and constructed per the EDDS Chapter 7.

Side sewer connections to the sanitary sewer main in Capitol Way will not be allowed due to surcharge problems with that main. The ideal tie-in location will be to the sanitary sewer system in Union Ave utilizing the existing 6" side sewer that serves the site.

8. Storm Drainage

A storm drainage system shall be provided that collects and treats runoff from the site in accordance with the *2009 Drainage Design and Erosion Control Manual for Olympia*. This project will be classified as a "Redevelopment" project and is subject to Minimum Requirements 1-10. The project site is in an area exempt from Minimum Requirement #7 Flow Control per Figure 2.4 of the 2009 Drainage Design and Erosion Control Manual. An offsite analysis will be required to verify adequate downstream capacity is available to allow for the direct discharge exemption.

The requirement for runoff from roof downspouts to be dispersed, infiltrated or directed to a pond is exempt if the project meets the flow control exemption requirement (downstream analysis).

The new storm system will not be allowed to tie into the combined storm/sanitary system on Capitol Way. There is a separated storm system on Columbia with an existing storm manhole on Union that would be an ideal location to tie into the storm system.

9. Pavement

Provide asphalt concrete pavement for roadways as needed for utility patching, sidewalk construction patching, and vehicle access to building.

10. Pavement Markings and Signage

Provide pavement marking for roadway as needed to replace and match existing markings disturbed or damaged during construction including crosswalk striping and lane markings.

Street name, parking, regulatory and warning signs shall be installed as required by the City of Olympia.

Capitol Campus signs will be provided by the owner to be installed by the Design-Builder Contractor.

11. Concrete Curb Gutter and Sidewalks

Provide concrete sidewalks for pedestrian access on all four sides of the site. New sidewalk and curb ramps shall be in accordance with City of Olympia and meet ADA requirements. New sidewalk shall include coloring and scoring pattern per Capitol Campus requirements. Coordinate parking meter removal with the City of Olympia per Article 1030, B., 4. Demolition, above. Parking meters shall be reinstalled by the Design-Build contractor per the EDDS Std Detail 4-41a.

Curb bulbs shall be constructed on Union Street per EDDS 4C.071 Pedestrian Bulb Outs.

Companion ramps on corners opposite of the 1063 block building may be required to meet ADA standards. If those ramps do not meet current standards the Design-Build Contractor shall remove and replace the ramps with ADA compliant ramps at the direction of the City of Olympia.

12. Illumination System

Streetlights shall be installed per EDDS 4Flight system. Existing lighting may remain where it meets current standards, but illumination levels shall be verified if lighting is to remain. The Design-Builder shall coordinate with PSE for electrical service to the illumination system.

**C. Quality of Materials and Systems**

1. Earthwork

- a. Structural fill shall meet the requirements determined by the geotechnical engineer.
- b. Subgrade material for sidewalks and roadway shall be per City of Olympia EDDS.

2. Water Supply System

- a. Potable water system shall be per EDDS Chapter 6.
- b. Reclaimed water system shall be per EDDS Chapter 10.

3. Sanitary Sewer Systems

- a. Sanitary sewer system shall be per EDDS Chapter 7.

4. Storm Drainage

- a. Storm drainage pipe and drainage structures shall be per EDDS Chapter 5.

5. Pavement

- a. Pavement shall be per EDDS Chapter 4.00 Transportation.

6. Pavement Markings and Signage

- a. Signs provided by DES per 10 14 00 of 2008 Guidelines & Requirements.
- b. Signs per 32 00 00 Section 2.1 of 2008 Guidelines & Requirements.
- c. Pavement markings and signs per EDDS Chapter 4, Section 4B.050.

7. Cement Concrete Curb Gutter and Sidewalks

- a. Concrete per 03 00 00 of 2008 Guidelines & Requirements.
- b. Base materials and concrete placement per 32 10 00 Bases, Ballast and Paving of 2008 Guidelines and Requirements.
- c. Sidewalk coloring mix shall be per West Campus Sidewalk Coloring requirements.
- d. Curb, sidewalk, and curb ramps shall be constructed per City of Olympia EDDS Standard Details.



**D. Special Considerations**

1. Traffic Control  
Pedestrian access must be maintained in accordance with City of Olympia requirements. Coordinate with City of Olympia regarding temporary pedestrian access requirements and temporary sidewalk closures.
2. Sustainability and LEED  
This project must achieve a minimum rating of LEED Gold. One element the Design-Builder shall consider is a current or future connection to the City of Olympia Reclaimed Water System.
3. Construction Permits  
The Design-Builder is responsible for obtaining all required permits as listed below and others as needed for the performance of the work. See Appendix, Section II, j. Design-Builder / Owner Responsibility Matrix.
  - a. EPA NPDES Permit. (Design-Builder procured and paid)
  - b. Building Permit. (Design-Builder procured and Owner paid)
  - c. City of Olympia Right of way / Street use Permits. (Design-Builder procured and paid)
  - d. Construction Stormwater Discharge Permit. (Design-Builder procured and paid)
  - e. City of Olympia Utility Connection Permit. (Design-Builder procured and paid)

## **1040 Structural Design Criteria**

### **A. Narrative and Systems Overview**

1. The facility provided shall be suitable for general office use with structural provisions for areas of increased loading for lobbies, meeting areas, computer rooms, egress facilities, light storage, loading docks, and other uses specified in the Section V. Design Program - Space Program, Room Data Sheets, Drawings and Diagrams. In addition to a requirement to meet minimum standards included in governing building codes, State of Washington facilities guidelines, and this RFP, the structural system should provide a comfortable working environment, serviceability, minimal maintenance requirements, flexibility to accommodate future changes in occupancy, and low life cycle costs.

### **B. General Code and State Requirements**

1. Design and Construction shall be as per the listed or most current version of the following as modified by information in this RFP:
  - a. "2012 International Building Code" as adopted by the State of Washington and the City of Olympia
  - b. "Facilities Design Guidelines & Construction Standards" General Administration
  - c. "Leased Space Requirements", Department of Enterprise Services

### **C. Quality of Materials and Systems**

1. Any construction type that meets the requirements of applicable building codes and this RFP, and provides standards of serviceability, maintenance requirements, flexibility for future changes in occupancy, and life cycle costs as specified in referenced State of Washington standards and guidelines may be used.
2. Design and Construction to be as per specified or latest edition of the following:
  - a. Foundations, excavation, and subgrade preparation shall be as per Geotechnical Report, Prepared by Golder Associates, November 12, 2013.
  - b. Concrete: ACI 318.
  - c. Masonry: TMS 602-08/ACI 530.1-08/ASCE 6-08.
  - d. Structural Steel: AISC Specifications for Structural Steel Buildings AISC 360 and Seismic Design Manual AISC 341.
  - e. Cold Formed Steel: AISI North American Specification for the Design of Cold-Formed Steel Structural Members, 2007.
3. Use of non-standard construction types, materials, or construction methods will require approval by the State based on submitted evidence including testing, reports, calculations, and government and association approvals demonstrating that Code, State, and RFP requirements and intent are being met.

### **D. Special Considerations**

1. Loading  
Minimum live loading shall be as per ICB table 1607. In addition to Office loading including a dead load allowance for moveable partitions in general areas, specific higher live loading capacity for lobbies, large and extra-large meeting areas, dining, egress facilities, computer rooms, and storage including filing shall be provided either in specific areas or general zones meeting program area requirements in other parts of this RFP. Mechanical and Electrical Rooms shall be designed for the equipment provided with a minimum equipment load capacity of 125 psf.

2. **Essential Facilities/Seismic Requirements**  
The facility is not considered an Essential Facility, however the structure shall be designed as a Risk Category III building using  $I_s=1.1$  (snow) and  $I_e=1.25$  (Seismic) per ASCE 7-10 table 1.5-2. Bracing of mechanical, electrical, and communication wiring in areas designated as WSP Command Post shall be designed using  $I_p=1.5$ .
3. **Floor Vibration and Acoustics**  
Floor vibrations shall be limited by an Acceleration Limit of .05% per AISC Steel Design Guide Series 11, Table 4.1. The structure in conjunction with non-structural components shall limit sound transmission and other acoustical measures as specified in other portions of this RFP.
4. **Structural Grid and Depths**  
The structural grid and column layout shall be coordinated with office modules and open space requirements specified in other parts of this RFP. Depth of structural members shall be limited to provide required ceiling height and other space requirements with an allowance for ceiling, mechanical, and electrical equipment.
5. **Flexibility for Future Tenant Changes**  
For any structural system that will limit the ability for modifications (ie, post-tensioned concrete) for changes in tenants uses such as new plumbing penetrations or additional stairs between floors, block-outs or areas allowing for future penetrations shall be provided and located on record drawings
6. **Compatibility with Non-Structural Elements**  
The structure and expected structural movements due to wind, seismic, and temperature fluctuation shall be compatible with non-structural components and their attachments to the structure. Sufficient separations shall be provided to preclude damage to non-structural components or unintended effects on the structure under code specified movements.
7. **Roof shall be designed to accommodate future photovoltaic panels and tenant required antennas / communication devices.**

## 1050 Conveyance Systems

### A. Narrative and Systems Overview

1. Vertical Transportation Analysis Requirements: The vertical transportation should be designed to meet the needs of the building, and their projected tenants, as well as meeting industry standards for this type of building. A design professional or elevator manufacturer capable of performing a vertical transportation analysis should provide a detailed analysis that identifies the quantity, type, size, speed and configuration for the vertical transportation. Minimum industry standards that should be met for this building are as follows:
  - a. Average Interval = No greater than 30 seconds during five minutes of peak one-way traffic.
  - b. Handling Capacity = Minimum 13% of the anticipated population during five minutes of peak one-way traffic.
  - c. Average Interval = No greater than 35 seconds during five minutes of peak two-way traffic.
  - d. Handling Capacity = Minimum 10% of the anticipated population during five minutes of peak two-way traffic.

The adequacy of elevator service is related to the length of time passengers wait for service and the ability of the elevator system to handle people and “vehicles” as they require service. Coordination with materials handling needs is necessary to ensure all movements are covered with adequate, but not excessive, backup capabilities. Standards for the comparison and evaluation of these two basic measures of elevator service have been developed. They are termed average interval and handling capacity.

Average interval is the “quality” measure and is defined as the elapsed time in seconds between elevator departures from a terminal floor averaged over a specific time period. Average interval is not a direct measure of how long prospective passengers wait for service. However, it is a value which can be calculated relatively easily and the accuracy of such calculations has been verified by countless tests. Such tests indicate average system response time for service at a typical intermediate floor approximates 65% to 80% of the calculated average interval during heavy incoming traffic periods. Average Interval will be used for evaluation of the garage passenger elevator groups only.

The “quantity” measure of elevator service is called handling capacity. This is defined as the number of persons and/or vehicles which can be transported by the elevator system in a given length of time. Five-minute peak periods for evaluation should be used for measurement purposes. This time period is long enough to provide meaningful, measurable information, but not so long as to allow peak activity to be disguised by average activity levels.

2. Elevator Application: Hydraulic elevators are not recommended if the building will have more than three levels that need to be served by the elevators, or if the minimum performance criteria identified above are not met once an analysis is completed. Environmentally friendly biodegradable hydraulic oil should be used if a hydraulic elevator application will meet the expected performance criteria and the building is no taller than three stories. Using machine-room-less traction elevators is recommended. This elevator application has become the industry standard type of elevator, and is the highest performing and most energy efficient application available. The application uses a compact gearless traction machine that is mounted inside the shaft.

Passenger elevators should have a minimum capacity of 3500lbs. and should be provided with center opening doors for the most optimal vertical circulation. One elevator

should be designed to handle back-of-house operations, and should have a minimum capacity of 4500lbs. and should be provided with side opening doors. The larger elevator should also have a 10'-0" tall cab height to assist with moving office furniture and other material throughout the building. One elevator should be able to accept an emergency gurney.

## **B. General Code Requirements**

Vertical transportation design and installation should conform to all applicable standards including the following Codes, regulations and inspection processes:

1. Compliance with Regulatory Agencies: Comply with most stringent applicable provisions of following codes, laws, and/or authorities, including revisions and changes in effect:
  - a. Safety Code for Elevators and Escalators, ASME A17.1.
  - b. Guide for Inspection of Elevators, Escalators, and Moving Walks, ASME A17.2.
  - c. Elevator and Escalator Electrical Equipment, ASME A17.5.
  - d. Washington Administrative Code (WAC).
  - e. National Electrical Code, NFPA 70.
  - f. Americans with Disabilities Act, ADA and A117.1.
  - g. Local Fire Authority.
  - h. Requirements of most stringent provision of local authority having jurisdiction.
  - i. Life Safety Code, NFPA101.
  - j. International Building Code (IBC).
2. Acceptance Testing: On completion of elevator installation and before permitting elevator use (either temporary or permanent), perform acceptance tests as required and recommended by ASME A17.1/CSA B44 and by governing regulations and agencies. The State of Washington Labor and Industries elevator division is the applicable Code Authority having jurisdiction.
3. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times that tests are to be performed on elevators.
4. Check operation of each elevator with Owner's personnel present before date of Substantial Completion. Determine that operation systems and devices are functioning properly.

## **C. Quality of Materials and Systems**

1. Manufacturer Standards: Products by one of the major manufacturers should be used as the basis of design for the vertical transportation included in this project. These manufacturers include: KONE Inc., Mitsubishi Elevators and Escalators USA, Otis Elevator Company, Schindler Elevator Corporation, ThyssenKrupp Elevator or an approved equal. An approved equal manufacturer will need to be manufactured in a factory that has an equal ISO rating as determined by the International Organization for Standardization to one of the listed manufacturers. Additionally, an approved equal manufacturer's product will need to have been released for installation for a duration comparable to the average duration of the listed manufacturers.

Products will be required to meet the seismic performance for the building as determined by the design-build team.

2. Material Standards: Provide materials conforming to the following minimum standards:
  - a. Sheet Steel (Furniture Steel for Exposed Work): Stretcher-leveled, cold-rolled, commercial quality carbon steel, complying with ASTM A366, matte finish.

- b. Sheet Steel (for Unexposed Work): Hot-rolled, commercial quality carbon steel, pickled and oiled, complying with ASTM A568/A568M-03.
  - c. Structural Steel Shapes and Plates: ASTM A36.
  - d. Stainless Steel: Type 302 or 304 for interior applications and Type 316 for exterior applications complying with ASTM A240, with standard tempers and hardness required for fabrication, strength, and durability. Apply mechanical finish on fabricated work in the locations shown or specified, Federal Standard and NAAMM nomenclature, with texture and reflectivity required to match Architect's sample. Protect with adhesive paper covering.
  - e. Aluminum: Extrusions per ASTM B221; sheet and plate per ASTM B209.
  - f. Plastic Laminate: ASTM E84 Class A and NEMA LD3.1, Fire-Rated Grade (GP-50), Type 7, 0.050"  $\pm$  0.005" thick.
  - g. Fire-Retardant Treated Particle Board Panels: Minimum 3/4" thick backup for natural finished wood and plastic laminate veneered panels, edged and faced as shown, provided with suitable anti-warp backing; meet ASTM E84 Class "I" rating with a flame-spread rating of 25 or less, registered with Local Authorities for elevator finish materials.
  - h. Natural Finish Wood Veneer: Standard thickness, 1/40" thoroughly dried conforming to ASME/HPMA HP-1983, Premium Grade. Place veneer, tapeless spliced with grain running in direction shown, belt, and polish sanded, book-matched. Species and finish designated and approved by Architect.
  - i. Glass: Laminated safety glass, minimum 9/16" thick, conforming to ANSI Z97.1 and CPSC 16 CFR Part 1201.
3. Submittal Standards: Provide details for proposed product as part of the design documents including the type, size, capacity, speed and configuration of the elevators, as well as proposed cab interior and lobby finishes, fixtures, and security provisions.

Additionally, identify the performance of the proposed vertical transportation. This should include the door opening and closing times, acceleration rates, floor-to-floor times, and noise output as measured inside the elevator cab under any condition including door operation and car exhaust blower set on its highest level.

Submittals for Owner review should include the following information for the vertical transportation equipment:

- a. Include plans, elevations, sections, and large-scale details indicating openings at each landing, machine room, equipment space layout, coordination with building structure, relationships with other construction, and locations of equipment.
- b. Include fixture drawings detailing car operating fixtures, hall fixtures and any security of fire status panel fixtures.
- c. Include samples of finish materials as requested by Owner.
- d. Submit a detailed schedule that includes manufacturing lead-times as well as installation milestones.
- e. Submit a Code compliant Maintenance Control Program specific for the proposed vertical transportation equipment.
- f. Submit a list of proposed closed out documents.



4. Warranty and Maintenance Service Standards: The vertical transportation system should include the following minimum standards for product warranty and maintenance service:

Manufacturer's Warranty: Manufacturer agrees to repair, restore, or replace elevator work that fails in materials or workmanship during the maintenance service term.

Failures include, but are not limited to: operation or control system failure, including excessive malfunctions; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.

Warranty starts from date of substantial completion until vertical transportation contractor no longer maintains the equipment.

Beginning at Substantial Completion, maintenance service shall provide full maintenance by skilled employees of elevator contractor. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation at rated speed and capacity. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

Maintenance service will be based on a Code compliant Maintenance Control Program specific for the vertical transportation installed in the building. Include specific performance expectations, monthly costs, billable rates and terms as part of the plan.

## **1060 Mechanical System General Requirements**

### **A. General Building Description**

The purpose of this Request for Proposal (RFP) document is to establish the minimum performance and quality standards for the 1063 Block Redevelopment design competition in Olympia WA. The Design-Build contractors will use this RFP to prepare their designs for the building mechanical systems.

The selected mechanical subcontractor will be entirely responsible for the design, permitting, building, start-up and testing of all the mechanical, fire protection, and plumbing systems. The design shall be the responsibility of the mechanical engineers of record who shall be registered professional engineers in the State of Washington. The mechanical contractors shall provide complete and functional systems.

The mechanical Design-Build contractors shall provide a written guarantee for a period of one year from the date of substantial completion that covers the entire system including equipment, materials and workmanship. The Design-Build contractors shall provide a written five year energy performance guarantee as part of the design competition outlined in other sections of the RFP.

### **B. Codes and Standards**

1. 2012 International Building Code with Washington Amendments
2. 2012 International Mechanical Code with Washington Amendments
3. 2012 International Energy Conservation Code with 2012 Washington Amendments (WAC 51-11C)
4. 2012 International Fire Code with Washington Amendments
5. 2012 Uniform Plumbing Code with Washington Amendments
6. 2011 National Electrical Code
7. ASHRAE Standard 62 – Ventilation
8. ASHRAE Standard 55 – Thermal Comfort
9. ASHRAE Standard 90.1: Energy Standard for Buildings except Low-Rise Residential Buildings
10. 2009 LEED for New Construction
11. ADA or Uniform Federal Accessibility Standards
12. National Fire Protection Association (NFPA) Standards
13. National Electrical Manufacturers Association (NEMA)
14. National Electrical Contractors Association (NECA)
15. American National Standards Institute (ANSI)
16. Institute of Electrical and Electronic Engineers (IEEE)
17. Underwriters Laboratories (UL)
18. General Administration Facilities Design Guidelines & Construction Standards 2008
19. GA Facility Design and Construction Standards, 2008 Edition.
20. Leased Space Requirements, Department of Enterprise Services, Real Estate Services, July 2005.
21. RCW 70.235.050 Green House Emission Limits for State Agencies

**C. LEED Goals**

The State of Washington wishes the Design-Build proposer to incorporate a sensibly sustainable design for the new facility. The Design-Build proposer should submit a design and design options for a building that cost effectively conserves energy and water. The project must achieve, at minimum, LEED Gold certification.

1. Quality of Materials and Systems

The Design-Builder proposal shall include a list of materials and equipment that will be used on the project. Where applicable the list shall include:

- a. Piping material used.
- b. Allowable water heater manufactures.
- c. Allowable pump manufacturers.
- d. Allowable boiler manufacturers.
- e. Piping test requirements.
- f. Other equipment not included in this list that describes the quality of materials that will be provided.

2. Special Considerations

There is the potential for building to be connected to the LOTT reclaim water system in the future. The building should be designed to use this resource in the future. The increased cost of any special equipment or piping systems for this system should be provided as part of the design-build proposal.

- a. Submittals: Provide product data sheets and/or prescriptive specifications for the major pieces of equipment as part of the RFP submission.

**D. Greenhouse Gas Emissions**

Provide a description of how this project will reduce greenhouse gas emissions and help State agencies meet the requirements of RCW 70.235.050 Green House Emission Limits for State Agencies.

## 1062 Plumbing Design Criteria

### A. General Code Requirements

Plumbing systems shall be designed and built to meet current codes. Provide for required permits, inspections, construction sequences, quality assurance, and safety practices.

### B. Plumbing Design Criteria

Plumbing piping sizing criteria is outlined in Table 1 below.

Domestic Water Piping	
Minimum Pressure	35 PSI at most remote outlet
Maximum Pressure	80 PSI
Static Pressure Loss	Maximum 6 psi per 100 feet
Velocity	Maximum 8 feet per second (Cold Water) Maximum 5 feet per second (Hot Water)
Waste and Vent Piping	
Sizing	Per Uniform Plumbing Code
Piping Slope	Minimum 1/4" per foot

Table 1: Plumbing Piping Sizing Criteria

### C. Plumbing Fixtures

1. All plumbing fixtures including lavatories, sinks, floor drains, shall be commercial grade low flow fixtures complete with trim. The plumbing contractor will be required to connect to any equipment requiring plumbing connections.
2. Toilets shall have a single manual flush option (dual flush are not desired) with delayed automatic flush. Waterless urinals are not acceptable for this project.
3. Acceptable fixture manufacturers are summarized below. Plumbing fixture types and their minimum performance requirements are shown in Table 2 below.
4. Manufacturers are based on the following:
  - a. Fixtures: American Standard, Kohler.
  - b. Floor Drains/Sinks: J.R. Smith.
  - c. Trap Primers: J.R. Smith, Prime-EZE
  - d. Faucets: Delta Commercial, Chicago.
  - e. Drainage products: JR Smith, Josam, Zurn, Wade, Watts.
  - f. Refer to Table 2 below for minimum performance requirements of fixtures.

Plumbing Fixture Types and Minimum Performance Requirements					
Fixture	Location	Type	Control	Flow	Notes
Water Closet	Restrooms	Wall hung, vitreous china	Sensor Operated flush valve	1.28 GPF	ADA provided where required
Lavatory	Restrooms	Under Counter mounted, vitreous china	Sensor Operated	0.5 GPM	ADA provided where required
Urinal	Restrooms	Wall Hung, vitreous china	Sensor Operated flush valve	0.5 GPF	ADA provided where required
Sink	Kitchenettes	Self rimming, counter mounted, Stainless steel	Single lever faucet, swing spout	1.5 GPM	ADA faucet Insta-hot at sink
Sink	Lactation room	Self rimming, counter mounted, Stainless steel	Dual handle faucet, goose neck spout	1.5 GPM	ADA faucet
DF-1 Drinking fountain with bottle filler	Varies	Dual height with bottle filling station, stainless steel	Front push pad operation for drinking fountains and sensor operation at bottle filler	1.5 GPM at bottle filler	Refrigerated

Table 2: Plumbing Fixture Types and Minimum Performance Requirements

#### D. Narrative and Systems Overview

##### 1. Quality of Materials and Systems

The Design-Builder proposal shall include a list of materials and equipment that will be used on the project. Where applicable the list shall include:

- Piping material used.
- Allowable water heater manufactures.
- Allowable pump manufacturers.
- Allowable boiler manufacturers.
- Piping test requirements.
- Other equipment not included in this list that describes the quality of materials that will be provided.

##### 2. Sanitary

A complete sanitary waste and vent system will be provided. Piping slope will be a minimum of 1/4" per 1'. Waste and vent piping shall be no-hub cast iron or bell and spigot.

Review WSP Latent Print Lab for any special piping requirements. Provide trap primers for all floor drains and floor sinks. The sanitary sewer connection will ideally use the existing 6" connection at the alley where it ties into a manhole in Union. If this cannot work the sanitary should be connected into the line that runs in Union and Columbia. The City of Olympia does not want the sanitary system tied into the line on Capitol Way.

##### 3. Storm Water

A roof and overflow drain system will be provided as required by code and City of Olympia Drainage Design and Erosion Control Manual. The overflow storm drain system will daylight utilizing downspout nozzles at the first floor level above grade. Storm piping shall be no-hub cast iron or bell and spigot. The storm connection will ideally be tied into

a designated storm system on Columbia St. The City of Olympia does not what the storm tied into the combined sanitary/storm system.

4. Natural Gas

Natural gas service is available to the site from Puget Sound Energy. Natural gas may be used for building or domestic water heating. If natural gas is used a single utility meter will be provided. Gas piping will be installed per Washington State codes and Puget Sound Energy requirements.

5. Domestic Cold Water

Potable water is available from the City of Olympia water system.

The domestic water system shall be provided with positive means to control backflow, with appropriate backflow preventers at sources of possible contamination within the building, such as mechanical equipment or industrial cold/hot water systems.

Cold water will be distributed to the plumbing fixtures. Freeze-proof hose bibs should be distributed around perimeter of building, and be provided for the recycle rooms, trash room, near mechanical equipment, and where it may be required for cleaning or servicing of equipment. All distribution piping shall be copper.

Vertical domestic water risers will be provided with isolation valves at each floor.

Irrigation: A backflow device will be provided for the irrigation system within the water service room. Irrigation piping will be stubbed out of the building for the landscape use.

6. Domestic Hot Water

Domestic hot water can be provided by natural gas hot water heaters, heat pumps, electric hot water heater, or source that supports the project energy goals and budget. Domestic hot water will be distributed throughout the building with a water recirculation system. All distribution piping shall be copper. The domestic hot water system components shall be controlled by the building management system. Water will produce 140F temperature water for health purposes and delivered to the fixtures at a maximum of 120F to plumbing fixtures.

7. Industrial Cold and Hot Water

Industrial cold water may be provided for HVAC system makeup water. Industrial water systems will be isolated from the domestic water system by means of a reduced pressure backflow preventer.

Industrial hot water is not anticipated for the project.

8. Solar Water Heating

Solar water heating systems are acceptable for the project. System diagrams, method of freeze protection, and other design considerations should be provided as part of the design-build proposal. The anticipated energy savings and a potential economic incentives available should also be provided with the design-build proposal. Provide infrastructure for addition of a future solar hot water heating system.

**E. Special Considerations**

There is the potential for building to be connected to the LOTT reclaim water system in the future. The building should be designed to use this resource in the future. The increased cost of any special equipment or piping systems for this system should be provided as part of the design-build proposal.



**F. Submittals**

Provide product data sheets and/or prescriptive specifications for the following equipment as part of the RFP submission:

1. Plumbing Fixtures.
2. Plumbing Equipment.
3. Any special energy saving fixtures, equipment or materials.

## 1064 Heating, Ventilating and Air Conditioning Design Criteria

### A. Thermal Comfort and Indoor Air Quality

Building HVAC systems will be designed to comply with ASHRAE Standard 55-2004. Achieving LEED 2009 Credit 7.1 is desirable. The Design-Build proposer shall include a narrative description for how indoor environmental quality will be achieved. The narrative should include where local exhaust will be included, use of operable windows, thermal zoning recommendations, and expanded comfort bands.

The table below summarizes the minimum zoning requirements.

Minimum Thermal Zoning Requirements	
Exterior Perimeter Enclosed Offices	≤250 sf/zone
Interior Enclosed Offices	≤ 500 sf/zone
Exterior Perimeter Corner Offices	Separately zoned
Conference Rooms	Separately zoned
Open Area Offices	≤1,000 sf/zone

### B. Narrative and Systems Overview

#### 1. General

The State requires that the mechanical systems are reliable, have a proven track record for operation and service, and are easily maintainable.

Complete and fully operational mechanical systems within the project, including the coordination of work with other specification divisions. All work shall be completed in accordance with applicable codes. Provide for required permits, inspections, construction sequences, quality assurance, and safety practices.

All work is to be coordinated with other trades by General Contractor. All materials shall be new and of reputable quality. Contractor shall provide one year warranty for all work and materials. All equipment and systems installation shall provide for required maintenance space as recommended by manufacturer or code as a minimum.

#### 2. Quality of Materials and Systems

The Design-Builder proposal shall include a list of materials and equipment that will be used on the project. Where applicable the list shall include:

- a. Piping material used.
- b. Allowable air handler manufactures.
- c. Allowable chiller manufacturers.
- d. Allowable boiler manufacturers.
- e. Allowable fan manufacturers.
- f. Allowable heat exchanger manufacturers.
- g. Allowable pump manufacturers.
- h. Ductwork materials and construction standards.
- i. Ductwork pressure testing requirements.
- j. Piping test requirements.
- k. Allowable terminal unit manufacturers.
- l. Allowable packaged equipment manufacturers.
- m. Other equipment not included in this list that describes the quality of materials that will be provided.

3. Heating Systems

The building heating loads shall be calculated as required by the 2012 Washington State Energy Code. Consideration should be given to architectural systems that can reduce building heating load. Provide redundant heating source and pumps.

Include the following as part of the Design-Builder proposal:

- a. Narrative describing the heating system and methods used to improve efficiency.
- b. Conceptual heating system plan.
- c. List of specific major heating equipment.
- d. Cut sheets of recommended heating equipment.
- e. Allowable vendors for each type of equipment.

4. Cooling Systems

The building heating loads shall be calculated as required by the 2012 Washington State Energy Code. Consideration should be given to architectural systems that can reduce building cooling load. Provide redundant cooling water pumps. Carrier is the preferred chiller for vendors.

Provide independent cooling systems for telecom, IDF, and MDF rooms.

Include the following as part of the Design-Builder proposal:

- a. Narrative describing the cooling system, methods used to improve efficiency, description of how passive strategies are used if applicable.
- b. Conceptual cooling system diagram.
- c. List of specific major cooling equipment.
- d. Cut sheets of recommended cooling equipment.
- e. Allowable vendors for each type of equipment.

5. Air Handling Systems

The building loads shall be calculated as required by the 2012 Washington State Energy Code and Washington State Mechanical Code. Energy recovery should be used where practical.

Include the following as part of the Design-Builder proposal:

- a. Narrative describing the air handling system, methods used to improve efficiency, locations of independent local exhaust.
- b. Conceptual air handling system diagram.
- c. List of specific major air handling equipment.
- d. Cut sheets of recommended air handling equipment.
- e. Allowable vendors for each type of equipment.

6. Controls

A direct digital control (DDC) Bacnet compatible system will be provided to control and monitor all HVAC equipment and systems. Valve and damper actuation will be electric type with Belimo as the preferred vendor. The control system will be integrated into the existing system to allow full control and monitoring from the existing operator's terminal. The control system will perform all required control functions, including optimization of equipment and system performance, reliability, equipment life and energy consumption.

An extensive measurement and verification system is anticipated to carefully monitor all of the building's energy use. Provide metering system to meet the WSEC, LEED EAc5, and to verify the energy performance requirements. Provide a strategy and associated costs for metering the individual tenant heating and cooling energy.

Preferred controls system is JCI Metasys.

7. Additional Considerations  
Consideration should be given to future use of the reclaim water system.

## **1066 Fire Protection Design Criteria**

### **A. Design Criteria**

The entire building will be totally sprinklered in accordance with NFPA 13. A detector double check assembly will be provided for the fire service.

The fire sprinkler system shall comply with NFPA 13, and local Fire Marshal requirements. In general, the fire sprinkler system shall consist of connection to new water service, including electric fire pumps, jockey pump, controllers, automatic transfer switch, main flow alarm station, zone control valves and flow indicators, alarm bell, fire sprinkler piping and heads. All related fire protection accessories as required will be provided. Coordinate location and type of tamper, flow, and pressure switches with the fire alarm system. All fire sprinkler piping to be concealed.

Fire flow information may be obtained from: local fire department in cooperation with City of Olympia Fire Marshall.

It is anticipated that a fire pump will be required.

### **B. Narrative and Systems Overview**

#### **1. Wet Pipe Sprinkler System**

The entire building will be sprinkled in accordance with NFPA 13. In general, system to consist of connection to new water service, including detector double check assembly, main flow alarm station, zone control valves and flow indicators, alarm bell, wet and combination standpipe, standpipe hose valves, fire department connection, roof outlets, wall and/or post type control valves for roof outlets, and sprinkler piping and heads. All required system isolation valves shall be provided with tamper switches.

Class 1 standpipes with required hose connections will be provided within stairways in accordance with NFPA 14. The sprinkler system/combination standpipe system shall provide a fire protection system designed and installed in strict accordance with NFPA, OFC, and local Fire Marshal requirements.

The design-builder shall verify and if necessary provide sufficient fire hydrant locations to service the new building.

#### **2. Dry Pipe Sprinkler System**

Dry pipe sprinkler systems will be used where sprinklers are subject to freezing.

Provide separate pricing for using schedule 80 pipe for areas where piping is exposed in public areas.

#### **3. Gaseous Fire Extinguishing System**

Gaseous fire extinguishing systems are not anticipated for the project. It is anticipated that a pre-action fire sprinkler system would be utilized in areas housing computer, radio and telecommunications equipment (e.g., MDF, IDF and equipment rooms).

### **C. Quality of Materials and Systems**

Sprinkler heads typically to be concealed head type with sidewall type, polished chrome escutcheons (in specialty areas as required) and upright rough brass finish type heads in unfinished areas. Horizontal dry sidewall sprinkler heads will be provided for overhangs, loading docks, and other perimeter areas subject to freezing. Quick-Response heads will be provided in all light hazard areas.

## **1070 Electrical – Power Distribution Design Criteria**

### **A. General Building Description**

1. The Design-Build contractors will use this RFP narrative to prepare their designs for the building electrical systems.
2. The selected electrical subcontractor will be entirely responsible for the design, permitting, building, start-up and testing of all the electrical, emergency power, photovoltaic, lighting, lighting controls, fire alarm, tele/data, distributed antenna, audiovisual, and other low voltage systems as described throughout the RFP document. The design shall be the responsibility of the Electrical Engineer of Record who shall be a registered Professional Engineers in the State of Washington. The electrical contractors shall provide complete and functional systems.
3. The electrical design-build contractors shall provide a written guarantee for a period of one year from the date of substantial completion that covers the entire system including equipment, materials and workmanship.
4. The electrical system shall comply with the following:
  - a. National Electrical Code as amended and adopted by the local authority having jurisdiction.
  - b. National Electrical Safety Code (NESC).
  - c. NFPA 70E, Electrical Safety in the Workplace.
  - d. WAC 296-46B.
  - e. Washington State Energy Code, latest adopted edition.
  - f. GA Facility Design and Construction Standards, 2008 Edition.
  - g. Leased Space Requirements, Department of Enterprise Services, Real Estate Services, July 2005.
  - h. NFPA 72, National Fire Alarm Code.
  - i. International Fire Code, latest adopted edition with local amendments.
  - j. American's with Disabilities Act Accessibility Guidelines (ADAAG).
  - k. LEED.

### **B. Quality of Materials and System**

1. The Design-Build proposal shall include a submittal of materials and equipment that will be used on the project. Where applicable, the list shall include:
  - a. S&C Vista Switch.
  - b. Medium voltage cable.
  - c. Load break elbows.
  - d. Medium voltage parking stands.
  - e. Ground bushings.
  - f. Medium voltage phasing and connection plan with Owner sign-off.
  - g. Underground vaults.
  - h. Dimensioned vault drawing showing Vista Switch with clearances indicated.
  - i. Medium voltage ground wire.
  - j. Main switchboard load calculations.
  - k. Main switchboard, 12.47kV section.
  - l. Main switchboard transformer.
  - m. Fire pump service transformer as required.
  - n. Main switchboard 480Y/277 volt section.
  - o. Main switchboard main circuit breaker.
  - p. Main switchboard feeder breakers.

- q. Fire pump power design.
- r. Metering at main switchboard for both incoming and photovoltaic system output.
- s. Emergency generator (and enclosure, if exposed to outdoor temperatures).
- t. Remote annunciator for emergency generator.
- u. Generator fuel tank.
- v. Generator battery charger.
- w. Generator block heater.
- x. Generator silencer.
- y. Transfer switches.
- z. Short Circuit Study.
- aa. Coordination Study.
- bb. Selective Coordination Study.
- cc. Arc flash study.
- dd. Arc flash labels.
- ee. Panelboards.
- ff. Distribution panels.
- gg. Transformers.
- hh. Surge Protective Devices.
- ii. Power meters and metering network.
- jj. Conduit.
- kk. Wire.
- ll. Fittings.
- mm. Bushings.
- nn. Junction boxes.
- oo. Seismic bracing and support details per Structural criteria and manufacturers' requirements
- pp. Ground bars.
- qq. Poke-throughs.
- rr. Conduit supports.
- ss. Lightning protection system.
- tt. Fire Alarm System.
- uu. Photovoltaic system provisions.
- vv. Photovoltaic system.
- ww. Grounding components, including ground rod and ground bushings.
- xx. Labeling.
- yy. Lighting controls.
  - i. Occupancy sensors.
  - ii. Daylighting sensors.
  - iii. Power packs.
  - iv. Relay packs.
  - v. Scene controllers.
  - vi. Programmable lighting control panels.
  - vii. Typical lighting control wiring diagrams for each room type.
- zz. Electric car charging stations
- aaa. Light Fixtures
- bbb. Lighting footcandle calculations for all spaces, interior and exterior
- ccc. Exit signs
- ddd. Emergency lighting units (bugeyes)

### **C. Site Demolition**

1. Disconnect electrical utility from buildings to be demolished. Remove underground conduit and wire. Coordinate outages with Puget Sound Energy and Owner prior to

disconnection. Remove equipment not owned by Puget Sound Energy. Remove panelboards and switchboards and discard if the Owner elects not to keep.

2. Coordinate street lighting power demolition and relocation with Puget Sound Energy. Re-feed relocated street lights with new power system per Puget Sound Energy requirements. See Civil for further information.

**D. Medium Voltage Service**

1. The building shall be connected to the Capitol Campus's 12.47kV system. Two new feeders shall be brought to a new S&C Vista Switch that contains two interlocked input switches, three output switches, overcurrent control, fault interruption, readily accessible bushings, SF6 insulation, and visible contacts. Provide two spare output switches in addition to the switch that feeds this project. The switch shall be located in a vault sized per NEC and NESC requirements to ensure the required working clearances at this voltage level.
2. The two feeders will be circuits 16 and 17. Circuit 17 is in a small pull vault at the southwest corner of Capitol Way and 11th Avenue. Circuit 16 is available in a vault on the west side of Capitol Way and 12th Avenue. Coordinate all feeder outages with the Owner 90 days in advance. Intercept feeders with load break elbows (separable connectors) listed per IEEE 386 that are managed with a hot stick, and provide parking bushings, grounding lugs, plugs, and insulated caps as required. Provide additional vaults to meet bending radius and cable pulling requirements. Fully coordinate every aspect of this installation with the campus engineering team prior to performing any work. Replace the small vault that contains feeder 17 with a larger vault per the above.
3. All underground conduits for medium voltage shall be 5". Provide three (3) spare 5" conduits in all ductbank runs.
4. All vaults shall be Oldcastle (preferred manufacturer) concrete structures with hatches that are traffic-rated, non-skid, galvanized, with a recessed hasp, and spring assisted double doors. The vault shall be either located under a sidewalk or flush turf with adequate cover. Provide a sump with a tight-lined pump and bottom infiltration.
5. The output of the switch shall route to a secondary unit substation inside the building, which shall transform the voltage from 12.47kV to 480Y/277 volts.
6. All medium cable shall be 15kV shielded power cable, Type MV-105, 133% EPR insulation level, copper.
7. Route all medium voltage feeders with a #4/0 ground wire. Provide a ground rod in each vault and bond all metal parts within the vaults to the ground rod and the #4/0 ground wire.
8. All terminations shall be made using load break elbows.

**E. Secondary Normal Distribution**

1. Size the main service for the following:
  - a. Lighting – 1 watt/sf.
  - b. Receptacles – 5 watts/sf.
  - c. WSP Latent Print / Forensic Labs – 10 watt/sf.
  - d. Mechanical – 15 watts/sf.
  - e. Server Room and IDFs – 150kW.
  - f. Kitchen – 200kW.
  - g. Audiovisual – 50kW.



- h. Elevators – 300kW.
- 2. The main electrical service shall consist of a secondary unit substation, having two primary 12.47kV HVL fused switches (one for a fire pump per NEC requirements), a 12.47kV-480Y/277V low impedance dry-type transformer, a single main circuit breaker with a Square D Powerlogic meter that has a communications module that interfaces with the local and global energy management system, and distribution sections. Consideration should be given to an outdoor pad mount transformer for energy conservation reasons. Bus shall be copper. Provide separate neutral and ground busses. Main breakers shall be individually mounted and have ground fault protection. Feeder circuit breakers shall be molded case and group mounted.
- 3. Provide alternate pricing and engineering analysis for locating 12.47kV-480Y/277V low impedance oil-filled transformer outdoors instead of inside as part of a secondary unit substation. Analysis shall include assessment of heat load mitigation if the transformer is inside the building.
- 4. There are two HVL switches, one for the building load and one for the fire and jockey pumps per NEC 695.5. The HVL switches shall have a viewing window that provides a visible break of all phases. Provisions shall be made for grounding disconnected portions of the system. Provide a surge arrestor in each switch.
- 5. The low voltage sections shall be rated 600 volts, even though they are used at 480 volts.
- 6. The 480 volt sections shall have fully rated horizontal and vertical busses, matching the capacity of the main breaker.
- 7. All circuit breakers 225 amp and above shall be fully adjustable LSI, with the main breaker having LSIG. All circuit breakers 100 amp to 200 amp shall have an instantaneous setting. The circuit breaker for the surge protective device may non-adjustable molded case.
- 8. Provide phase loss, phase unbalance, and phase reversal protection on the main circuit breaker.
- 9. If the main electrical service is located in a below-grade room, a duplex pump station shall be provided. Duplex pump stations are required for all below-grade electrical rooms.
- 10. Provide fire pump service connection per NEC Article 695.5. Provide separate 12.47kV-480V transformer for the fire pump and jockey pump.
- 11. Square D, GE, or Eaton/Cutler-Hammer.

**F. Emergency and Standby Power**

- 1. Provide a diesel engine/generator for this project that feeds Emergency, Legally Required, and Optional Standby loads as follows:
  - a. Emergency
    - i. Egress lighting.
    - ii. Exit signs.
    - iii. Fire alarm.
    - iv. All elevators that are part of the exit path, including stretcher sized elevators.
  - b. Legally Required
    - i. Smoke pressurization.

- ii. Smoke control.
- iii. Fire Pump and jockey pump.
- c. Optional Standby – See Add Alternate for Tenant Generator
  - i. MDF / IDF Room power and air conditioning.
  - ii. LEG and OFM Agencies – 10% of plug load, distributed through their space.
  - iii. Selected rooms in the Washington State Patrol side, lights, receptacles, and HVAC. The following is a list provided from the Washington State Patrol:
    - 1) BFS – None.
    - 2) CID – None.
    - 3) COM – None.
    - 4) CRD – 6 AFIS terminals, desktop computers, lights, HVAC.
    - 5) CVD – Multiple terminals for SafetyNet, HVAC.
    - 6) ESD – Network Monitoring, VOIP, Network Equipment Room.
    - 7) FLB – None.
    - 8) FOB – None.
    - 9) GMR – None.
    - 10) HRD – None.
    - 11) IAD – None.
    - 12) ITD – Up to 6 terminals for technical support, desktop computers, lights HVAC.
    - 13) MCSD – See CVD.
    - 14) OOC – None.
    - 15) OPS – None.
    - 16) RMD – None.
    - 17) SOD – Capital Detachment Office, Conference Room for Command Post.
  - iv. Security system.
  - v. Rooftop communications system components.
- d. ESD's Network Operation Center, Tier 3 Support, and Network Equipment rooms will need up to 4 terminals each with 24/7 power/phone/data HVAC support for all racks. WSP maintains its own statewide VoIP telephone system. VoIP equipment resides in the Network Equipment room and requires 24/7 power/HVAC to maintain communications during power outages via Power Over Ethernet and Trunk connectivity.
- e. The power systems for Emergency and which are Legally required shall be selectively coordinated per NEC Article 700.27 and 701.18.
- f. Normal, emergency, legally required, and optional standby branches shall be in separate conduit systems, including branch feeders and branch circuits.
- g. The Washington State Patrol lab is not required to have generator back-up.
- h. The generator shall be manufactured by Cummins/Onan and have 72 hours of fuel at full load, located in a UL 2085 fuel tank, preferably sub-base. Provide dial type fuel gauge and calibrated dip stick.
  - i. Provide a design of the generator pad that restrains the generator per the manufacturer's recommendations. Design shall also be designed for anticipated seismic forces. Design shall be designed and stamped by a Registered Structural Professional Engineer in the State of Washington.
  - ii. Provide emissions mitigation per Puget Sound Air Quality standards and per Thurston County requirements. Contractor shall manage the application process for Thurston County and the Puget Sound Air Quality enforcement agency.

- i. Provide a separate circuit breaker for a load bank. The load bank circuit breaker shall be automatically tripped off in a power outage.
  - j. Provide separate breaker for the fire pump.
  - k. The generator shall have the capability to shed optional standby loads in the event of a generator overload via its control panel, which will tell the transfer switch to go to the neutral/center-off position.
  - l. Provide a BACNET output for remote monitoring of the generator.
  - m. Provide a wired remote annunciator. Locate as directed.
  - n. Transfer switches shall be manufactured by Cummins/Onan. ATSS shall have BACNET communications.
  - o. Provide critical grade silencer and Schedule 10 stainless steel exhaust system.
- 2. Provide up to three transfer switches for the above branches. All transfer switches shall be time delay neutral style.
  - 3. Provide an installation for the fire pump and jockey pump that meets the requirements of NEC Article 695.
  - 4. The Emergency and Legally Required power systems shall use circuit breakers.

**G. Power Studies**

- 1. Provide short circuit study to determine the available fault current at each piece of electrical power distribution equipment (Vista Switch, switchboards, distribution panels, panelboards, motor control centers, etc.), disconnect switches, variable frequency drives, elevator controllers, UPSs, and mechanical equipment with feeders sized over 60 amps. Verify that equipment being provided is rated for the available fault current.
- 2. Provide a coordination study that determines settings of breakers to optimize coordination. Include the Vista Switch in this analysis, since it has devices that need to be set.
- 3. Provide a selective coordination study that recommends settings of breaker to meet the requirements of NEC 700.27 and 701.18 for Emergency and Legally required loads.
- 4. Provide an arc flash study for all equipment listed above per NFPA 70E requirements. Label all equipment with pre-printed labels that indicate the hazard risk category, incident energy at 18 inches, the flash protection boundary, recommended PPE, shock hazard circumstance, limited protection boundary, restricted protection boundary, prohibited protection boundary, and tool and glove requirements.

**H. Panelboards**

- 1. All panelboards shall use copper bussing. Circuit breakers shall be bolt-on type. Enclosures shall be hinged door-in-door type.
- 2. Panelboards shall be fully rated for the available fault current. Series rated systems are not allowed.
- 3. Feeders to panelboards shall match the bussing rating of the panelboard, i.e. #4/0 wire to a 225 amp panel.

4. Panelboards feeding office areas, IDFs, labs, and server rooms, shall have 200% neutral bars. Feeders to these panelboards shall have 200% neutrals.
5. All main circuit breakers shall be individually mounted, molded case.
6. Provide 20% minimum spare breakers in each panelboard.
7. Provide typewritten panel schedules in all panels and switchboards..
8. Provide a 30A-3P breaker in the first panel on the output of a transformer for an externally mounted Surge Protective Device.
9. Square D, GE, or Eaton.

**I. Transformers**

1. Transformers shall be dry type with 220 degree C insulation.
2. Windings shall be copper.
3. NEMA TP-1.
4. Sound level shall not exceed 35dB.
5. 10kV BIL.
6. Provide k-13 transformers for all office and IT loads. All feeders on the output of k-13 transformers shall have 200% neutral conductors.

**J. Uninterruptible Power Supply**

1. All UPS's shall be Owner Furnished, Contractor Installed. There will be a UPS in the main server room, roughly 100kW, and one rack-mounted UPS in each IDF. Include feeders to the UPSs. Assume a separately mounted external maintenance bypass cabinet for the server room UPS.
2. Assume 12 racks (4 post racks) in the MDF room, each requiring two L5-30R and two L6-30R receptacles.
3. Assume three racks in each IDF, each requiring two L5-30R and one L6-30R which will be obtained from the back of the UPS. Verify with Owner.

**K. Power Metering**

1. Provide metering per the Washington State Energy Code and as required by LEED. The meters shall be monitored by the Energy Monitoring System (typically Medicis) and use BACNET as the communications protocol. The Veris Hawkeye system has been used in other projects.
2. Provide a meter on the server room UPS feed.
3. Provide a meter for each IDF UPS.
4. Provide separate meters for air conditioning associated with the server room and IDFs.
5. Meter each tenant separately.

**L. Wiring Methods**

1. All wiring shall use conduit and wire as the wiring method. MC cable is not permitted.

2. PVC conduit (Schedule 80) shall only be used underground. Elbows and vertical conduit risers shall be Galvanized Rigid steel Conduit (GRC).
3. GRC conduit shall be used above ground outdoors and in areas subject to damage from vehicles or equipment.
4. EMT conduit shall be used indoors where not subject to damage. Minimum size shall be 3/4".
5. Couplings and connectors shall be *waterproof* steel compression-type only. Zinc-die-cast, malleable, setscrew, and indent couplings and connectors shall not be used.
6. All wiring shall be stranded copper only. No solid or aluminum wire. Minimum #12 for power and lighting circuits. #14 minimum for controls.
7. Insulation shall be THHN/THWN for interior branch circuits. Feeder conductor insulation shall be THHN/THWN or XHHW-2.
8. Use threaded rod and/or a trapeze supported with threaded rod to support overhead raceway. Do not attach to the ceiling grid.
9. See Washington State standards for wire identification requirements.
10. If poke-throughs are used, they shall be flush-only with the floor and have metal hinged covers. Walker, Hubbell, or approved equivalent.

**M. Device Layouts**

1. Locate receptacles and associated tele/data outlets within 6 inches of each other.
2. Locate receptacles as follows:
  - a. Offices – One utility and one isolated ground duplex each on two opposite walls.
  - b. Conference Rooms – One isolated ground duplex every 8 feet. One utility duplex near each door. Provide a poke-through or floor box at each table leg where a connection to an under- or in-table powerstrip is being provided. Provide underneath the center of the table if a connection to the table will be at the center. Provide receptacles every four feet at banquets with dedicated utility circuits.
  - c. Computer Training Room – Provide double duplex around the perimeter of the room with two dedicated circuits each. Provide poke-throughs or floor boxes as required to reach desks or tables that are not against the wall.
  - d. Corridors – One utility receptacle for housekeeping every 50 feet maximum along hallways and corridors. Provide receptacles adjacent to elevators and in stairwells at each landing.
  - e. Provide receptacles every 4 feet on countertops in kitchens.
  - f. Provide receptacles every 4 feet on office countertops.
  - g. Provide receptacles for each piece of equipment.
  - h. All utility, electrical, mechanical, janitor, and storage rooms shall have at least one utility duplex receptacle near the door. Janitor's room must be GFCI if there is a mop sink.
  - i. Provide a receptacle within 25 feet of all mechanical equipment.
  - j. Provide GFI receptacles at all kitchen countertops, within 6 feet of sinks, and outdoors.
  - k. Provide exterior weatherproof GFCI receptacles near each exterior door, each with a dedicated utility circuit.

**N. Circuiting Requirements**

1. At most five receptacles shall be connected to a circuit where not designated otherwise in this section.
2. Provide dedicated 20 amp circuits for each the following. Dedicated circuit receptacles shall be identified with a red dot:
  - a. Photocopiers, using an isolated ground receptacle.
  - b. Laser printers, using an isolated ground receptacle.
  - c. Microwaves.
  - d. Vending machine.
  - e. Coffee machine, provide with 12 hour timer receptacle.
  - f. Two at kitchenette counters.
  - g. Two at locker room counters
  - h. Toaster.
  - i. Refrigerator.
  - j. Dishwasher.
  - k. Equipment as needed.
3. Provide one circuit per four seats in meeting and conference rooms.
4. Provide one circuit per two seats in the computer training room.
5. Provide one circuit per two workstations in the EOC Operations Room
6. For furniture systems, provide standard 8-wire furniture feeds, including oversized neutrals.
7. Provide one circuit per four workstations maximum. The LEG agencies may have a few isolated areas with higher load needs. Verify with Owner whether there are any high power users that may need their own dedicated circuit.
8. Provide dedicated neutrals for all circuits intended to feed computers unless they are feeding pre-wired workstations, in which case, a shared oversized neutral shall be used.
9. Provide isolated ground (IG) for circuits that are for computer loads. Provide isolated grounding conductor in addition to equipment grounding conductor.
10. Receptacles shall be Leviton 20 amp specification grade. Confirm with DES the style and type. Utility receptacles shall be ivory. Computer receptacles shall be orange with isolated ground.
11. Stainless steel cover plates or plates with a color that matches the building décor shall be used.

**O. Tenant vs. Core and Shell**

1. Meter core/shell loads separately from tenant loads.

**P. Tenant Separation**

1. Provide dedicated 120 volt panelboards for each tenant and meter them separately, unless the tenants are small enough that extra meters are more cost effective than extra panelboards. Washington State Patrol shall have its own panels, for instance. Provide dedicated lighting and mechanical circuits for each tenant so that tenants can be metered separated for each load type.

**Q. Flexibility**

1. Flexibility is a key feature of this project. Provide circuits in junction boxes that are strategically located in regular zones. Junction boxes shall contain terminal blocks for ready extension to other locations at a later date. Provide circuit quantities that not only work for the Day One design, but also reasonably anticipate potential changes.

**R. Labeling**

1. Label all major pieces of electrical equipment, including switchboards, distribution panels, panelboards, transformers, disconnect switches, variable frequency drives, UPSs, PDUs, transfer switches. Labels shall indicate the upstream source(s) and downstream loads, where applicable. Labels shall be 3-layer, and attached with screws, not just adhesive.
2. Label receptacles, switches, and furniture whips with panel and circuit number. Use labeler to produce small letters and numbers. Use black letters with a clear background for general circuits and red letters with clear background for computer circuits.
3. Provide orange labels for emergency equipment.
4. Transformer labels shall be metal and engraved with information required.

**S. Grounding**

1. Ground per NEC Article 250. Soares book on grounding shall be used as a guide.
2. Run all grounding electrodes to a ground bar within the main electrical room, which in turn connects to the main switchboard neutral bus.
3. Provide a UFER ground in addition to ground rods and bonding to water pipe at the main service.
4. All conduits shall have an equipment grounding conductor sized per Article 250.
5. Provide an isolated ground system for all office panels, configured as follows:
  - a. Provide isolated grounding receptacles where required, typically workstations for PCs.
  - b. Provide dedicated isolated grounding conductor back to panelboard, in addition to equipment grounding conductor.
  - c. Provide isolated ground bus in each panelboard that serves the computer loads.
  - d. Provide isolated grounding conductor to distribution panel upstream and its own isolated ground bus. The isolated grounding conductor in the feeder is separate from the equipment grounding conductor.
  - e. Run isolated ground feeder-conductor to main switchboard ground bar.
6. Provide a ground bar in each electrical room that is used for grounding transformers.
7. Provide a #4/0 ground riser in each stack of electrical rooms, which interconnects each the ground buses. The riser terminates on the main ground bar in the main electrical room.
8. Bond to the lightning protection system per NFPA 780 requirements.

**T. Lighting Controls**

1. Provide lighting controls per the Washington State Energy Code and per LEED. This includes:

- a. Occupancy sensors in all offices, storage rooms, closets, restrooms, conference rooms, break rooms, and other spaces less than 300 square feet. Provide additional controls in another other multi-occupant spaces as required by LEED.
- b. Coordinate with mechanical engineer if lighting control integration with the HVAC system is required. If the mechanical engineer requires lighting control integration, the ceiling mounted occupancy sensors shall shift the HVAC into an Unoccupied Mode of Operation after the room has been vacant for 15 minutes (AUTO OFF). The occupancy sensor shall either be equipped with an on-board relay contact or be programmed to operate one of the isolated relays in the digital control system module for use by a building management system for HVAC control. The occupancy sensor shall be programmed to operate the dedicated isolated contact closure in conjunction with the lighting controls. The occupancy sensor settings shall be high sensitivity and fixed time (not automatic learning). Contractor shall coordinate the specific manufacturer settings of the installed system to match the programming described above.
  - i. Conference Rooms
    - 1) The lighting fixtures in these rooms shall be controlled by a digital programmable wall box based dimming control system with the necessary control modules for the load types in each room. The dimming control system shall be provided with sufficient dimming channels to control each light fixture types individually as specified by the lighting designer.
    - 2) When a combined room is used in single mode lectern lighting is typically the fixture(s) furthest away from the operable partition. In combined mode the lectern lighting is typically the fixture(s) closest to the operable partition. Coordinate with architect which room's lectern should be active in combined mode.
    - 3) Each room shall have a minimum of one wall mounted remote button station with the buttons specifically programmed and labeled for the specific room per the matrix for button labeling and programming issued by the Lighting Designer or Architect. The remote button station shall have the capability to manually dim the currently activated scene up and down without additional fixtures, not included in the current scene, coming on. The dimming control panel shall also accept control signals from an audiovisual system to control lighting in each room where A/V systems are being provided; a RS232 serial interface port, shall be flush wall mounted behind the audio visual equipment rack location in each room. The key pad buttons for A/V control systems shall provide the users with full control of the room lighting levels including a minimum of four scenes: The scenes shall be similar to the following: Button 1: All On/Off; Button 2: Center On/Off; Button 3: Wall 1 On/Off; Button 4: Wall 2 On/Off; Button 5: Dim Up/Down.
  - ii. Automatic daylight zone control, using dimming ballasts not switching. Area of control shall not exceed 2200 square feet per Washington State standards. Where there are multiple entries into other same lighting zone, provide a switch at each point of entry.
  - iii. Automatic shutoff of permanently installed task lighting.
  - iv. Manual light reduction controls.
  - v. Controls shall be manufactured by Wattstopper, Lutron, or LC&D, or approved equivalent. Manufacturer shall have been in the business of manufacturing and providing service for lighting control equipment for similar capabilities and size, under the same name and ownership, for a minimum of three years preceding bid date of the project. All components and assemblies shall be factory pre-



tested prior to installation. Factory trained technicians shall be on site for start-up, commissioning and training. Factory trained technicians shall be available for telephone support twenty four (24) hours a day, seven (7) days a week. All equipment shall be U.L. listed lighting control equipment.

2. Provide a programmable lighting control panel that automatically sweeps on and off lights at set times. Flicker warnings shall be provided before lights are turned off.
3. Provide manual override switches roughly every 50 feet along main corridors so that occupants can switch the lights back on for another two hours.
4. Panel shall store its programming for at least ten hours after loss of power.
5. Panel may control exterior lighting as well, but must use an astronomic and photocell combination input to turn the lights on and off.
6. Panel shall be manufactured by Horton and have a BACNET interface. Connect to the campus lighting control network.

#### **U. Surge Protective Devices**

1. Provide externally mounted surge protective devices. They shall be connected to a circuit breaker within the equipment they are protecting.
2. Devices shall be rated for the available fault current.
3. They shall be UL Listed 1449, 3<sup>rd</sup> Edition.
4. The device at the main switchboard shall be rated 150kA, mode to mode.
5. Devices at panelboards shall be rated 50kA, mode to mode. Provide for all panels feeding lighting, and the first panel on the output of each transformer that serves offices and IT loads. Provide a device on the panel that feeds the server room UPS.
6. Provide 60A-3P breakers for switchboard SPD and 30A-3P breakers for panelboard SPD.

#### **V. LEED**

1. This project shall be LEED Gold (minimum).
2. Provide lighting controls to meet LEED requirements.
3. Photovoltaics
  - a. Photovoltaics are not typically found on the Capitol Campus, but should be studied as an option and shall be fully provisioned for, even if the technology doesn't go in on Day One. Provide the following, including if photovoltaics aren't installed as part of this project:
    - i. Provision for a system that provides 5% of anticipated energy consumption of the building.
    - ii. Provide separate reverse power flow meter and service disconnect within the main switchboard for the photovoltaic system.
    - iii. Provide spare conduits from the roof to the main switchboard for power delivery to the building system.
    - iv. Reserve sufficient roof area for the anticipated system.
    - v. Ensure that roof has sufficient structural strength for the weight and wind uplift of the system. Provide roof mount supports for the PV system.

- vi. Provide 1" metering conduit from the inverters to the anticipated location of the public digital display.
- 4. Review lighting design options that reduce the lighting watts per square to various levels below energy code.
- 5. Provide a lighting design that minimizes offsite glare.
- 6. Provide cut-off fixtures outside, but also keep in mind any campus standard fixture.
- 7. Provide electric car charging stations as required by the LEED checklist. Stations shall be compatible with all Electric Vehicle Supply Equipment (EVSE) Standards and Recommended Practices, including SAE J1772 NEC 625, UL 2231 and UL 2594. Provide 40 amp, 208 volt, single phase systems. Enclosure shall be rated NEMA Type 4 Watertight. Also provide 20 amp, 120 volt receptacles with dedicated circuits at each designated parking stall.

**W. Lightning Protection System**

- 1. Provide a UL Master Labeled Lightning Protection system per NFPA 780 requirements. The system shall consist of a ground ring around the building, air terminals, and down leads between the roof and the ground ring. Conductor materials shall be compatible with the roof material.

**X. Fire Alarm System**

- 1. Provide a Class A addressable fire alarm system per NFPA 72, consisting of speakers (not horns), strobes, valve and sprinkler flow monitors, smoke detectors, duct smoke detectors, elevator controls, fire pump monitoring, and other devices as required. Provide air handling shutdown as required. Provide smoke control and pressurization functionality if it is determined to be a requirement. Provide a remote annunciator at the main entrance if the fire alarm control panel is not located there.
- 2. Interface with a pre-action system within the main server room.
- 3. The fire alarm system shall be Johnson Controls/Notifier, and shall tie into the campus fiber optic fire alarm loop.

## **1072 Electrical – Lighting Design Criteria**

### **A. General Codes and Standards**

1. Lighting shall be designed to achieve the Desired EUI Goal (see Article 1020) and meet or exceed the Washington State Energy Codes in effect at the time of project permitting.
2. Lighting levels shall meet the IES (Tenth Edition) recommended light levels (within the limits of the energy code watt restrictions).
3. Egress lighting levels shall meet the requirements of the International Building Code and International Fire Code, along with any local amendments.

### **B. Testing Agencies**

1. All fixtures shall be UL and/or ETL listed. LED's shall be tested to LM-80-08 and LM-79-08. All lighting shall comply with NFPA, IBC, and ADA.

### **C. Light Levels and Maintained Footcandles**

1. High Density Open Office and Collaborative spaces: 30-40 footcandles.
2. Executive Offices: 30-40 footcandles.
3. Lobby and Reception Areas: 15-20 footcandles.
4. Conference Rooms: 20-40 footcandles.
5. Support/Supply Rooms and Break Room: 10-30 footcandles.
6. Low Use Storage Rooms and Janitor closets: 10 footcandles.
7. Electrical/mechanical, Server, Telecom and Elevator Machine Rooms: 20 footcandles.
8. Corridors, Restrooms and Phone Rooms: 10-15 footcandles.
9. Stairwells: 10 footcandles.
10. Parking Garage (if needed): 2-4 footcandles.

### **D. Lamp Types and Color Temperature**

1. Linear fluorescent T5 and/or T8 lamps with combined energy efficient electronic ballasts. LED with Remote Phosphor Technology. Minimum performance criteria are: minimum 82 CRI, 80 LPW (or greater) and color temperature of 3500K. Rated life for linear fluorescent shall be a minimum of 40,000 hours and 50,000 hours for LED.
2. Ceramic metal halide may be used in high ceiling applications but only if LED's provide insufficient illumination for targeted light levels.
3. Compact fluorescent sources will be avoided in order to reduce energy loads and extend maintenance.
4. High pressure sodium and mercury vapor sources will not be used.
5. Every effort shall be made to limit the number of lamp types on the project. The goal should be roughly five types.

### **E. Ballasts**

High efficiency electronic instant start ballasts shall be used throughout. When required for daylight response dimmed light levels, ballasts shall be 0-10v and dim to 10% of full output. Rooms with AV access shall include dimming ballast which dim from 100% to 1%.

### **F. Luminaire Efficiencies**

Luminaire efficiency for all sources to be 80% or greater.

**G. Emergency Egress**

Selected fixtures from general lighting layouts will be provided in all public areas and along the path of egress and will be backed up by the emergency generator so battery back-up is not required. Refer to Electrical narrative for more detailed information.

**H. Exit Signs**

All Exit signs shall be green LED. Edge-lit signs will be used in public spaces and aluminum housings in utilitarian areas. Bug-eyes shall not be used, except for a bug-eye in the generator room per NFPA 110 requirements.

**I. LEED**

Energy usage for lighting will target a 30% improvement over ASHRAE 90.1 2007, which is the baseline for LEED 2009 documentation. Should the credit for Sustainable Sites SSc8 be pursued, no light may trespass beyond the property line. Low mercury lamps may be used to achieve additional credit but only one manufacturer produces a product that meets the requirements (Philips). Enhanced controls may be considered in executive offices as well as open office areas.

**J. Space by Space Lighting Concepts**

1. All open office areas will utilize pendant direct/indirect linear fluorescent T5, T8, or LED lamps. Layouts will reinforce building architecture while remaining general enough to allow for future reconfigurations of work stations. Luminaires in daylight areas will have integrated photocells and 0-10VDC dimming ballasts.
2. Similarly, Executive offices will utilize pendant direct/indirect fixtures with T5 or T8 lamps. Room control devices will have integral occupancy sensors.
3. Fixture selections need to be consistent from floor to floor to minimize number/variety of lamps required to have in stock
4. Rooms with rows of shelving may include stack-integrated LED linear lighting to meet IES recommended vertical light levels on shelves. Supplemental lighting for general illumination may be fluorescent pendant direct, indirect or direct/indirect.
5. Copy rooms to have occupancy sensors so lights do not go out if in use after hours.
6. In Conference rooms, the lighting will be ceiling recessed to avoid AV conflicts. Sources will be linear T8 or LED and/or compact LED down lights and will dim from 100% to 1%. Presentation walls will be evenly washed with light. Provide 4-scene digital controllers that control dimming of each fixture type and fixture location type. Dim fixtures so that each of the following can be controlled separately: conference room table light, projection screen, side and rear wall, miscellaneous can lights, and podium.
7. Reception desks and public lobby areas will be illuminated with a combination of recessed LED downlights and pendant indirect fixtures to elevate the ceilings and highlight reception and seating groups. Recessed LED lensed wallwash fixtures will also highlight feature walls and/or signage.
8. In Circulation Areas, general lighting shall be provided by recessed linear fluorescent lighting to provide good general illumination on the walls.
9. All restrooms are occupancy sensor activated.
10. Public Stairs are to be illuminated in such a way that ladder-access for fixture maintenance will not be required. Sources may be LED or non-dim fluorescent.

11. Exit Stairs are to be illuminated with ADA wall mounted fixtures that are two-lamp T8 with dual ballasts for two levels of control. Fixtures will also have integral occupancy sensors which will turn one lamp off for energy savings when stairwells are unoccupied.
12. Back of House spaces including all electrical, mechanical and storage rooms are to be provided with basic T8 fluorescent strips. Wire guards shall be provided on all fixtures.

**K. Exterior Lighting**

1. Exterior lighting will include canopy or building mounted downlights at all exit doors. The primary entry doors will be featured with higher light levels. LED sources will direct light downward with full cut-off optics at all exit doors.
2. Outdoor path and shared public spaces shall be designed to minimize dark areas and promote a sense of security through use of high color-rendering sources at uniform light levels. Fixtures will be well shielded to avoid direct view to sources which add glare. Full cut-off luminaires will be used wherever possible to reduce upward-directed light and sky-glow. Limited and controlled directional uplighting may be used for signage and specialty features in limited locations and quantities. All exterior sources shall be LED.
3. The parking garage, an Alternate in this project, shall use high-performance LED luminaires with specialty controlled optics for parking garages.
4. Multi-level controls with combined photocell/time interface allow for reduced light levels and energy loads after office hours.

**L. Special Considerations: Lighting Control Systems for Energy Conservation**

1. Code required lighting automatic off controls will be via occupancy sensors in all rooms.
2. Code required lighting automatic off controls will be by a system of time programmable low voltage relays to control lighting during unoccupied hours.
3. Light fixtures in daylight zones shall be dimmable, controlled by local daylight sensors for continuous daylight dimming.
4. Conference Room: Preset Control System with RS232 interface with all AV systems.
5. Parking Garage and exit stairwells shall be circuited and zoned to reduce light levels when unoccupied.

## **1074 Integrated Security System Design Criteria**

The integrated security system consists of CCTV, ACS, IDS and cabling for these systems. The ISS will utilize the structured cabling system present throughout the building in the telecommunications design. The design shall follow the room data sheet requirements for access control.

All integrated security systems will utilize an IP based network for CCTV and ACS. Centralized equipment may reside in the MDF or IDF rooms as necessary to accommodate cabling requirements.

Security systems may share same pathways as other data networks within building.

### **A. Definitions**

1. Closed Circuit Television (CCTV)
2. Integrated Security System (ISS)
3. Access Control System (ACS)

### **B. General Codes and Standards Requirements**

Meet or exceed all DES Leased Space Requirements (July 2005), specifically A5.28 SECURITY ACCESS SYSTEMS and A5.29 SECURITY SURVEILLANCE SYSTEMS.

### **C. Applicable Tenant Standards**

1. A number of spaces within the building will be considered high-security. High-security spaces are controlled by ACS card-readers. Low-security spaces will be key controlled. Spaces to be considered high-security may be, but are not limited to:
  - a. MDF
  - b. IDF
  - c. Electrical
  - d. Building entries and Tenant Entries
  - e. Elevators

Note: Further definition of required secure areas within Section V. Design Program – Space Program, Room Data Sheets, Drawings and Diagrams.

2. Locate Maxxess Access Controllers in IDF spaces, one on each floor. Each access controller receives minimum Cat6A input and sends out RS485 to door controllers. Access controllers shall not be consolidated in a single space (such as the MDF) to reduce cost as this introduces a lower level of redundancy.

### **D. Base CCTV / Access Control Design**

1. The core system shall have Access Control and CCTV at the below listed locations:
  - a. Card reader locations:
    - i. All exterior doors
    - ii. MDF and IDF's
    - iii. Main entry points to tenant spaces
  - b. Camera locations should cover
    - i. All exterior doors and loading dock
    - ii. Lobby area
    - iii. All hallways
    - iv. MDF
2. Tenants may install CCTV/ACS in expansion to existing systems at their own expense at a future date. These may not be standalone systems and must integrate into the existing CCTV/ACS.

**E. WSP Requirements for CCTV and Access Control**

1. Location of CCTV and ACS for WSP spaces will be defined by WSP during programming. Monitoring of the security system will be done by WSP. Control will need to be separate from DES system.
2. Design will incorporate future use of proximity card system for computer station authentication.
3. During programming, standalone systems will need to be identified. Within the WSP tenant space specific user groups require security systems that are separate from DES or WSP systems. These systems will be incorporated into the building design.

**F. Quality of Materials and Systems**

1. Monitoring platform will be manufactured by Pelco.
2. Door control system will be manufactured by Maxxess.

## **1080 Radio System Design Criteria**

The building radio system will be designed to support first responder systems as the minimum requirement.

The design-build contractor will be responsible for identifying frequencies to be covered by distributed antenna system (DAS).

All DAS cabling will be coax and will follow structured cabling pathways from MDF through IDF's. DAS cabling will require an additional pathway from highest floor IDF to roof level. DAS cabling and antennas will be distributed throughout each floor from IDF space as necessary to provide adequate coverage. DAS equipment and other radio equipment will be located in a roof level room.

The DAS will be designed with the ability to support additional radio systems such as cellular and wifi.

### **A. General Codes and Standards Requirements**

The radio system shall comply with local codes for emergency responder radio coverage.

### **B. WSP Radio Communication Systems Coordination**

System shall be designed with a bi-directional amplifier.

Radio systems to be incorporated include but are not limited to:

1. Thurston County VHF
2. DES security radio 800 MHz
3. WSP use of VHF and 700 MHz communications

WSP will be on a separate Wi-Fi network from the building Wi-Fi network. These access points and routers will require additional cabling as an alternate. See Alternate Price Proposal Form.



## **1082 Telecommunication Infrastructure Design Criteria**

### **A. General Description**

This section of the report is intended to define the standards, criteria and assumptions used for the design, documentation and specification of a telecommunications systems infrastructure.

1. The telecommunication Design-Build contractors shall provide a written guarantee for a period of one year from the date of substantial completion that covers the entire system including equipment, materials and workmanship.
2. The telecommunication system shall comply with the following:
  - a. National Electrical Code as amended and adopted by the local authority having jurisdiction
  - b. National Electrical Safety Code (NESC)
  - c. GA Facility Design and Construction Standards, 2008 Edition
  - d. Leased Space Requirements, Department of Enterprise Services, Real Estate Services, July 2005
  - e. NFPA 72, National Fire Alarm Code
  - f. NFPA 70-1996 National Electric Code (NEC)
  - g. ANSI/TIA/EIA 568-B.1 Commercial Building Telecommunications Cabling Standard Part 1: General Requirements
  - h. ANSI/TIA/EIA 568-B.2 Commercial Building Telecommunications Cabling Standard Part 2: Balanced Twisted-Pair Cabling Components
  - i. ANSI/TIA/EIA 568-B.3 Optical Fiber Cabling Components Standard
  - j. ANSI/TIA/EIA-569-A Commercial Building Standards for Telecommunications Pathways and Spaces
  - k. ANSI/TIA/EIA-606 The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
  - l. ANSI/TIA/EIA-607-B Commercial Building Grounding and Bonding Requirements for Telecommunications
  - m. BICSI TDMM BICSI Telecommunications Distribution Methods Manual

### **B. Existing Services to Property**

All existing telecommunication services to the property shall be disconnected and decommissioned as part of the design-build. Coordinate with service providers to remove fiber and copper cabling from aerial and underground pathways.

### **C. Telecommunication Systems**

The Information Technology (IT) structured cabling design will provide the 1063 Block building with a complete infrastructure to support all network-related services. This includes adequate space planning, security, power, cooling, and a high quality structured cabling system. The design contractor will be responsible for complying with the room data sheets provided to understand the size and complexity of the telecommunication system. The telecom components will provide the foundation to support the building occupants' IT needs well into the future.

The structured cabling system will be provided as a certified cabling system. The manufacturer or manufacturers of the cable and termination components will qualify and warranty the performance of the entire system.

**D. Definitions**

1. Building Entrance Facility (EF): Located in MDF. Voice, data and video services are brought into the building in this room.
2. Main Distribution Frame (MDF): Building voice, data and video services are distributed to IDFs on all levels from this room.
3. Intermediate Distribution Frame (IDF): Used to distribute station cabling to workstation outlets and to house communications equipment.
4. Information Technology (IT): the service of providing data to support the business.
5. Backbone Cabling: Cables connecting EF to MDF and MDF to IDFs.
6. Horizontal Cabling: Cables connecting Standard Information Outlets to MDF, IDFs and consolidation points.
7. Fiber Optic (FO)
8. Copper cabling (CO)
9. Cable: Assembly of one or more conductors or optical fibers within enveloping sheath, constructed to permit the use of conductors singly or in groups.
10. Consolidation Point: Interconnection point within the horizontal cabling using ANSI/TIA/EIA-568-B.2 or ANSI/TIA/EIA-568-B.3 compliant connecting hardware installed in accordance with the requirements of clause 10 and rated for at least 200 cycles of reconnection.
11. Cross-connect: Group of connection points, wall or rack mounted, used to mechanically terminate and administer building wiring.
12. Intra-building: Within a single building
13. Inter-building: Between two or more buildings
14. Shielded Twisted Pair (STP): Balanced, 4-pair cable used for copper station cabling. Each pair is wrapped with a shielding material and the overall cable is also wrapped with a shielding material.
15. Unshielded Twisted Pair (UTP): Balanced, 4-pair cable used for copper station cabling and multi-pair copper backbone cables.
16. Telecommunications: Any transmission, emission, or reception of signs, signals, writings, images, sounds, or information of any nature by wire, radio, visual, optical, or other electromagnetic systems.
17. Local Area Network (LAN): Network or networks typically covering a small geographic area. Typically includes only client-owned cabling and equipment.
18. Wide Area Network (WAN): Network or networks typically covering a large geographic area. Typically includes client-owned and service provider-owned cabling and equipment.

**E. Connectivity and Cabling Components**

1. Each tenant office space may have different requirements for voice and data outlets within a defined square footage. Where there is not a set requirement by a tenant, the minimum number of outlets for a 10' by 10' work area space should follow the chart to be issued with future addendum along with the room data sheets.
2. All data cabling to workstation areas will be Cat6A.
3. Comply with all DES Leased Space Requirements (July 2005), specifically A5.27 VOICE/DATA CABLES AND RECEPTACLES (TELEPHONES AND COMPUTERS)
4. Tenants / WSP will maintain some operations which will be staffed 24/7 and require additional connectivity and cabling from the IDF. Cabling and connectivity requirements for these spaces will be identified and distributed to the Design-Builder through future addendum of room data criteria / sheets.

**F. WSP Equipment Rooms**

If required by the tenant, equipment rooms will be located on each floor alongside the IDF. Ideally the equipment room and IDF will share a wall for ease of cable pathways. Each equipment room will need to be sized to support the IT operations for the tenant. During programming, tenant size requirements will need to be gathered and will be reflected in the room data sheet. The purpose of the room is to provide a controlled environment for servers with redundant power, data, and cooling to the space. The space will be considered in use 24/7.

1. Systems equipment to be supported in the room:
  - a. Cable – FO and CO backbone to IDF hardware.
  - b. Network – network hardware to be provided by tenant. Inter-rack cabling to be provided by tenant.
  - c. Security – room is to be considered high-security with regards to access control.
  - d. Servers Room -servers and information storage in room to be provided by tenants.
2. Rooms shall be sized to support the tenant equipment cabinets with a minimum 4' clearance in front and back. Cabinets will be connected by 10" vertical cable management on each side. Tenant requirements supersede this recommendation.
3. Cable distribution shall consist of 18 inch wide cable ladders or raceways/trays mounted at 8 feet AFF above the backboard housing termination hardware, between that backboard and the equipment cabinets and across the top of the cabinets.
4. Floors shall be tiled or vinyl covered concrete. Carpeted floors are not acceptable due to static discharge. Rooms will not contain raised floors.
5. Ceilings will be left open to the structure above; there shall be no finished or drop ceiling in any telecommunications closets. Hard ceiling (or floor above) will be at least 9 ft above the finished floor.
6. Lighting: Sufficient, motion detector wall-switched (switch in the room), incandescent or fluorescent lighting shall be installed to illuminate the front and back side of all installed racks and the termination fields. Lighting shall be a minimum of 50-foot candles measured 3 feet above the finished floor, mounted 8.5 ft. above the finished floor. No wall-mounted lighting will be allowed. Multiple motion detectors may be required.
7. Horizontal Cabling Requirement: All cabling terminating in the ITS rooms used on this project will be UL rated and have the appropriate NEC rating for the areas that the cables

will be used, or traverse. For example cable that will reside or pass through a plenum area will be plenum rated, a cable that passes through a wet area shall be rated for wet areas.

8. Generator power will be provided to the equipment room space (See Generator Add Alternate. If a UPS is required, the tenant will be required to provide the UPS equipment and connectivity.
9. Comply with all DES Leased Space Requirements (July 2005), specifically A5.25 VOICE/DATA SERVICE DROP (DEMARICATION) and A5.26 TENANT'S VOICE/DATA DISTRIBUTION ROOM(S)

#### **G. Telecommunications Rooms**

##### **1. MDF**

- a. The building will contain one Main Distribution Frame which will act as a central telecom room and entrance facility for the building. Core telecommunications equipment supporting the entire building will be installed in this room.
- b. The intra-building backbone fiber and copper cabling runs will be connected from this room to the IDF via conduit. The number of conduits from the MDF to IDF shall be the minimum required plus 100 % spare. Cat6A UTP, SM and OM-3 fiber cabling will be extended to the IDF room from the MDF.
- c. This room size will accommodate a minimum of twelve (12) equipment cabinets. In all cases, a 4 ft service zone will be maintained at the front and rear of the equipment cabinets and at the end of each row of equipment cabinets. Space will be reserved in the MDF to add an additional equipment cabinet should this ever be necessary.
- d. The walls of the room shall be covered with 3/4 inch fire resistant plywood painted on all sides with light color fire resistant paint. Care should be taken to assure that the fire rating stamp of the plywood be visible for inspection prior to installation. Horizontal cabling termination hardware will mount to the painted 3/4 inch fire-rated plywood backboard on the wall opposite the rear of the equipment cabinet(s) facing the equipment cable connections. Entry door opens out, automatically closes, and is secured by an access-logging keycard entry system.

Typical MDF Telecommunications equipment includes:

- i. WAN routers
- ii. Core and Distribution switches
- iii. Access-Server switches
- iv. Access-User switches
- v. File servers
- vi. Terminal servers
- vii. PBX, Voice Gateways and other telephone-related equipment.
- viii. Voicemail System
- ix. Centralized UPS (if not located in an appropriate electrical room)
- x. Copper (UTP) termination hardware
- xi. Fiber Distribution Panel
- xii. Carrier equipment and termination hardware

##### **2. IDF**

- a. This is the room where telecommunications equipment supporting the horizontal distribution zone is installed. The IDF room will act as a demarcation between the DES and tenant space. The building will contain IDF spaces such that:

- i. All horizontal cable lengths from outlet to IDF are less than 250 feet.
  - ii. Area served by each IDF is less than 25,000 sq feet
  - iii. Horizontal network equipment fits in IDF racks with 50% spare rack space.
- b. The intra-building backbone fiber and copper cabling runs will be connected from this room to the MDF via conduit. The number of conduits from the MDF to IDF shall be the minimum required plus 100% spare. Cat6A UTP, SM and OM-3 fiber cabling will be extended to the MDF room. The SM and OM-3 fiber cabling will be plenum rated. The IDF will have 18 inch wide ladder type cable tray installed at 8 feet AFF installed around the perimeter of the room. The electrical distribution for the IDF will be from two panels located in the room, one normal utility and one from the generator system. Connected to each of these panels will be an overhead bus system for electrical distribution to the equipment cabinets. Within the equipment cabinets vertically mounted distributions units will provide the individual outlets for the equipment connections. Quad receptacle normal power convenience outlets will be installed on 6 foot centers along all permitted walls. Two stand-by power quad outlets will be provided on walls expected to support wall mounted active components.
- c. A 4 ft. service zone will be maintained at the front and rear of the equipment cabinets and at the end of each row of equipment cabinets. Horizontal cabling termination hardware will mount to the painted 3/4 inch fire-rated plywood backboard on the wall opposite the rear of the equipment cabinet(s) facing the equipment cable connections. The walls of the room shall be covered with 3/4 inch fire resistant plywood painted on all sides with light color fire resistant paint. Care should be taken to assure that the fire rating stamp of the plywood be visible for inspection prior to installation. Entry door opens out, automatically closes, and is secured by an access-logging keycard entry system
- d. Typical IDF equipment includes:
  - i. Access-User switches
  - ii. Terminal servers
  - iii. Copper (UTP) termination hardware
  - iv. Fiber Distribution Panel
- e. Comply with all DES Leased Space Requirements (July 2005), specifically A5.25 VOICE/DATA SERVICE DROP (DEMARICATION) and A5.26 TENANT'S VOICE/DATA DISTRIBUTION ROOM(S).

#### **H. Structured Cabling System**

- 1. The telecommunications cabling system shall be designed to conform to the requirements of EIA/TIA-568B, The Commercial Building Telecommunications Cabling Standard.
- 2. In conformance with the above referenced standard, the telecommunications cabling system shall be designed in a hierarchical star topology, with all cables meeting or exceed the mechanical and performance requirements of Section 10 of the standard.

#### **I. Backbone System Cable**

- 1. Twisted pair
  - a. All twisted pair cable shall be UTP Cat6A
  - b. All twisted pair cable lengths shall be less than 100m for network equipment connections

2. Single mode optical fiber
  - a. Cable shall be capable of a minimum 10 Gb/s transmission over distances of up to 2000m (OS1)
  - b. Quantity of fiber to be determined during design.
  - c. Cable shall be terminated with LC connectors
3. Multi-mode mode optical fiber
  - a. Cable shall be capable of a minimum 10 Gb/s transmission over distances of up to 300m (OM3)
  - b. Cable shall be sized to a minimum of 48-strands per IDF space
  - c. Cable shall be terminated with LC connectors

**J. Horizontal Wiring**

1. Horizontal system cable shall be Category 6A Unshielded Twisted Pair between the IDF and workstation spaces. Cable shall be run in cable tray pathways throughout the work area.
2. The term “horizontal wiring” refers to a number of cable types that run from a communications closet on a particular floor of a building to workstations, telephones, wireless access points, printers and other devices on that floor. Interconnection cables between closets on the same floor typically include some combination of copper and fiber optic cables. Careful design work on the horizontal cable pathways to minimize total cable length will help to lower wiring costs and in some cases might decrease the total number of wiring closets needed to serve a building.
3. All cables must be marked clearly and legibly at both ends with floor, room and jack number for easy identification.

**K. Horizontal Pathways**

1. Horizontal pathways shall be cable tray. Conduit shall be run from wall outlet and stubbed to ceiling, then j-hooked to cable tray. If copper and fiber share the same cable tray, a barrier shall be installed to separate cable types. Horizontal pathways should consider future use for tenant requirements. Horizontal cabling must be designed to accommodate diverse user applications, including Data communications and Building Automation Systems.
2. Ceilings used as distribution pathways for horizontal cabling shall meet the following conditions:
  - a. If a fixed ceiling has to be used as a cable route, or specialized oversized tile, a properly sized conduit or cable tray must be installed as a pass through. Where conduit is used, a pull string will be provided in each conduit. Pull boxes with access doors may be required depending on distance and design. Cables may not make 90 degree turns within the pull box. No direction transition may take place inside pull boxes.
  - b. Drop-ceilings of lay-in tiles which allow easy access to a suitable space above are recommended. Suitable space is defined as that which supports the installation and ready use of a 18 inch x 4 inch side wall basket type cable tray. These cable ladders should be installed in all hallways in the areas indicated on the construction drawings. All areas along the cable tray pathway will be accessible. Per NEC code the maximum cable tray fill ratio is 40%.
  - c. Pathway shall be sized to 100% spare capacity over initial usage.
  - d. Height of the cable ladder/raceway tray above the finished floor shall be no more than 11'. There must be at least 3 inches of clear space above the cable tray for

- access. At least 12 inches of clearance will be maintained between the cable tray and any lighting fixtures and at least 4 feet of clearance will be maintained between the cable tray and any other sources of electrical interference such as motors and generators.
- e. No conduits, pipes, wires, threaded rod or any other obstruction may penetrate the interior area containing the cables or be mounted below the cable tray. Cable trays must be supported on each edge of the cable ladder; no center supports will be used.
  - f. Metal cable ladders/raceways shall be bonded to the building ground per applicable code (using a minimum of 6-gauge wire).
  - g. Ancillary low-voltage wiring may not be run within the same section of the cable tray or raceway as data cabling. All pathways shall allow for a minimum 3" of clear vertical space above the ceiling tiles and support channels to ensure accessibility. Design will coordinate pathways with mechanical, lighting, and other systems to maintain separation.
3. All horizontal pathways that penetrate fire-rated barriers must be fire stopped in accordance with applicable codes.

#### **L. Entrance Facility**

- 1. This is the area where telecommunications service providers deliver their services to the building. A minimum of eight (8) 4" conduit shall be run into the EF from each of two separate in-ground communications vaults to provide for diverse service entries from at least two separate providers. A provider is defined as a State agency or a telco utility. The in-ground communications vaults shall be located close to the property line and separated by a minimum of 100 feet. Conduits extended from the in-ground communications vaults shall be routed so that maximum separation is maintained prior to entering the EF room. Vaults shall be owned by DES and be made available to all IT Vendors. The EF room is a wholly DES facility. All copper and fiber cabling for the building will terminate in the EF then be cross-connected to backbone cabling to MDF and IDF. The EF shall be located adjacent to the MDF room if space permits. Consideration shall be made for additional telco utility services (T1 lines or similar) to utilize the EF.
- 2. In ground communications vaults need to be large enough to support large service loops for multiple fiber optic cables.
- 3. Copper cabling and any metallic elements that are part of the fiber cabling will be terminated onto building protection systems. All carrier equipment and termination hardware shall be located in the EF and these services extended to the MDF/IDF via cabling connections.

#### **M. Outside Plant (OSP) Backbone and Pathways**

- 1. OSP cabling and pathways will be designed to provide connectivity from DES, CTS, Legislative, tenant, and telco utilities. All connections shall be redundantly routed from the source. Two separate in-ground communications vaults will be installed: one on the South side and one on the West side of the building. Campus OSP cabling will be designed to complete a loop with other campus services.
- 2. The data system will use fiber optic cabling to bring data service into the building at the EF from either buried vault. The data backbone will be sized at a minimum of 36 total fiber optic strands per service, including 24 single mode strands and 12 multimode strands. All fiber strands will terminate on LC connectors in rack mounted patch panels in the EF.

3. All cabling shall rated for outside plant use. All outdoor inter-building pathways shall allow for 100% spare capacity over initially installed cabling.

#### **N. Grounding and Bonding**

1. A uniform telecommunications grounding and bonding system shall be provided in accordance with TIA Joint Standard-607-B, Grounding and Bonding Requirements for Telecommunications in Commercial Buildings. This system shall be designed in conjunction with the electrical power grounding system. The following guidelines are provided for the design of the system.
2. The telecommunications grounding backbone shall consist of solid copper busbar and copper conductors interconnected in the following manner:
  - a. Main electrical ground to the telecommunications main grounding busbar (TMGB) located in the MDF room.
  - b. The TMGB to individual telecommunications grounding busbars (TGBs) installed in the IDF rooms.
  - c. The telecommunications grounding busbar in each of these rooms to the nearest point of grounding building steel, if available.
  - d. Where the electrical power is located within the MDF and IDF rooms, the TGB shall be bonded to the panel board's alternating current equipment ground (ACEG).
  - e. The TMGB shall be pre-drilled, a minimum of ½-inch thick, 4-inch wide solid copper bar, electrotin plated, and insulated from their supports by a 2-inch separation. The TGBs shall be pre-drilled for double lugs attachment, a minimum of ¼-inch thick, 2-inches wide solid copper bar, electrotin plated, and insulated from their supports by a 2-inch separation.
  - f. The telecommunication bonding backbone shall be sized at 2 kcmil per linear foot of conductor length up to a maximum size of 750 kcmil.
  - g. All bonding conductors shall be a minimum #6 AWG copper conductors. The conductor jacket shall be green in color or marked appropriately, and installed in continuous lengths.
  - h. All metallic raceways, racks and cabinets entering or located with a room with a TGB shall be bonded to the TGB.

#### **O. Mechanical and Electrical Requirements**

1. General  
No piping or ductwork will pass over or through any IT support room, unless they are used to provide services to the support rooms. Piping and ductwork used to provide services to these rooms will be coordinated with the anticipated IT equipment layout within the rooms.
2. Electrical Requirements  
IT support rooms will be connected to the building standby power source. Rack-mounted UPS equipment may be used to maintain system operation while the standby power source comes on-line. IT support rooms will be lit to a minimum of 50 foot candles between the equipment rack rows (measured at three feet above the floor) and will provide adequate vertical surface illumination to the bottom of racks. Access to IT support rooms will be controlled by the building access control system to allow the Owner to track access to the rooms.



3. Mechanical Requirements

IT support rooms will be maintained at between 68 and 80 degrees Fahrenheit with 30% to 50% relative humidity at all times (complying with TIA-569-C). If the building HVAC system cannot provide continuous operation or adequate capacity to meet these criteria, supplemental cooling units will be installed.

**P. Special Materials Provisioning**

All copper and fiber optic cabling should be manufactured by Corning or equivalent. Racks, cable management, and cable tray should be Corning or equivalent manufacture.

**Q. Applicable Tenant Standards**

1. The design-build contractor will follow all DES Leased Space Requirements 2005 and all Facility Design Guidelines and Construction Standards 2008.
2. Specifically in DES Leased Space Requirements 2005 comply with SECTION 16700 - VOICE/DATA DISTRIBUTION ROOMS.

#### **1084 Television Distribution Design Criteria**

Television service will be available throughout the building. Television service will terminate in IDF spaces on each floor and tenants will be responsible for connecting to television in the IDF. Dual coax backbone will be required from EF/MDF to all IDF's to provide redundancy within building. Amplification will be added as necessary on backbone to receive a clear signal at the IDF location.

## **1086 Telephone System**

A single PBX (analog / digital) system will feed the building. The PBX will be located in the MDF. PBX system will utilize minimum Cat6A cabling through structured cabling pathways to reach workstations throughout building.

The design does not call for a single VoIP system to serve the entire building. Tenants may choose to utilize the building structured cabling for individual VoIP systems.

## **1088 Audiovisual Spaces Design Criteria**

Audiovisual spaces shall be designed to provide presentation and audio technologies to support the operations of the building tenants. Each space shall be designed so that technologies aid in communication within the space and with connected spaces as required by the room. Refer to room data sheet for a listing of spaces and requirements.

### **A. General**

1. Equipment shall be new, unused, and undamaged.
2. Materials shall be new, free from defects and shall be designed to insure satisfactory operation and operational life in the environmental conditions which will prevail where they are being installed.
3. Prior to ordering equipment, the Contractor shall coordinate the frequencies of all new and existing wireless devices in the facility to prevent unwanted interaction between devices and rooms. This includes, but is not limited to, wireless microphones, assisted listening system devices, wireless control panels, etc.
4. Accessories, including rack mounting hardware, power supplies, etc., shall be obtained from the original equipment manufacturer. Unless otherwise noted or specified, third party accessories shall not be used.
5. Equality
  - a. Other products of equal quality and function may be furnished, subject to approval by the Owner, Architect, and Owner's Representative.
  - b. Proof of equality rests with the submitter. The Owner shall be the final judge of equality.
6. Owner Furnished Furniture
  - a. Room furniture will be furnished by the Owner.
  - b. Free standing computer furniture will be furnished by the Owner. Built in cabinetry at conference rooms is by Design-Builder.
7. Manufacturer
  - a. Do not provide an assortment. For each category, provide products of the same manufacturer; for each item, provide the same model for all pieces.
8. Accessories
  - a. Any standard accessory or item supplied by the manufacturer as part of the system shall be turned over to the Owner as a loose item at the time of project acceptance.

### **B. Complete Systems**

1. The systems mentioned shall be complete in every detail and fully operational upon completion of the project unless specifically noted otherwise. Mention of certain materials in these specifications shall not be construed as releasing the Contractor from furnishing such additional materials and performing all labor required to provide complete and fully operational systems.
2. The systems integrator will be responsible for determining the proper equipment compliment to provide complete and working systems, based on the operational requirements set forth in the specification.

**C. Physical Installation**

1. Equipment shall be firmly secured in place unless requirements of portability dictate otherwise.
2. Equipment shall have an engraved plaque permanently affixed, denoting its function.
3. Fastenings and supports shall be adequate to support their loads with a safety factor of at least three. Boxes, equipment, etc., shall be secured plumb and square.
4. In the installation of equipment and cable, consideration shall be given not only to operational efficiency, but also to overall aesthetic factors.
5. Equipment requiring power (such as line drivers) located in AV outlet boxes, shall be installed so that power is fed remotely from the main equipment location (i.e. AV Rack). Under no circumstances shall a remote device be powered from an adjacent receptacle unless permission has been granted by the Owner's Representative.

**D. General Code Requirements**

1. The following code and standards are referenced in the Division 27 specifications. Perform all work and provide materials and equipment in accordance with the latest referenced codes and standards of the following organizations:
  - a. American National Standards Institute (ANSI)
  - b. National Electrical Manufacturer's Association (NEMA)
  - c. National Fire Protection Association (NFPA)
  - d. Underwriter's Laboratories (UL)
  - e. American Disabilities Act of 2010
  - f. Current International Building Code (IBC)
2. Install the AV systems based on the following:
  - a. NFPA 70: National Electrical Code as adopted and amended by the Local Jurisdiction.
  - b. IBC: International Building Code as adopted and amended by the Local Jurisdiction.
3. The referenced codes establish a minimum level of requirements. Where provision of the various codes conflict with each other, the more stringent provision shall govern. If any conflict occurs between referenced codes and this specification, the codes are to govern. Compliance with code requirements shall not be construed as relieving the Contractor from complying with any requirements of the drawings or specifications which may be in excess of requirements of the governing codes and rules and not contrary to same.

**E. Quality of Materials and Systems**

1. Materials and equipment supplied by the Contractor shall be new and shall meet or exceed the latest published specification of the manufacturer in all respects.
2. At the time of submittal the Contractor shall supply the latest model for each piece of equipment.
3. Equipment and enclosures shall be UL listed, or equivalent.

**F. Room Types and Technology**

1. Rooms containing AV systems will follow the room types and technologies laid out in Section V. Design Program - Space Program, Room Data Sheets, Drawings and Diagrams.

Note: Future Addendum to the RFP will outline in more detail the conference room quantity, sizes and corresponding AV requirements. The infrastructure (power, network connectivity cabling to IDF and AV inter equipment cabling pathways) to serve all AV equipment is within the Design-Builder's scope of work.